OCTOBER 2019

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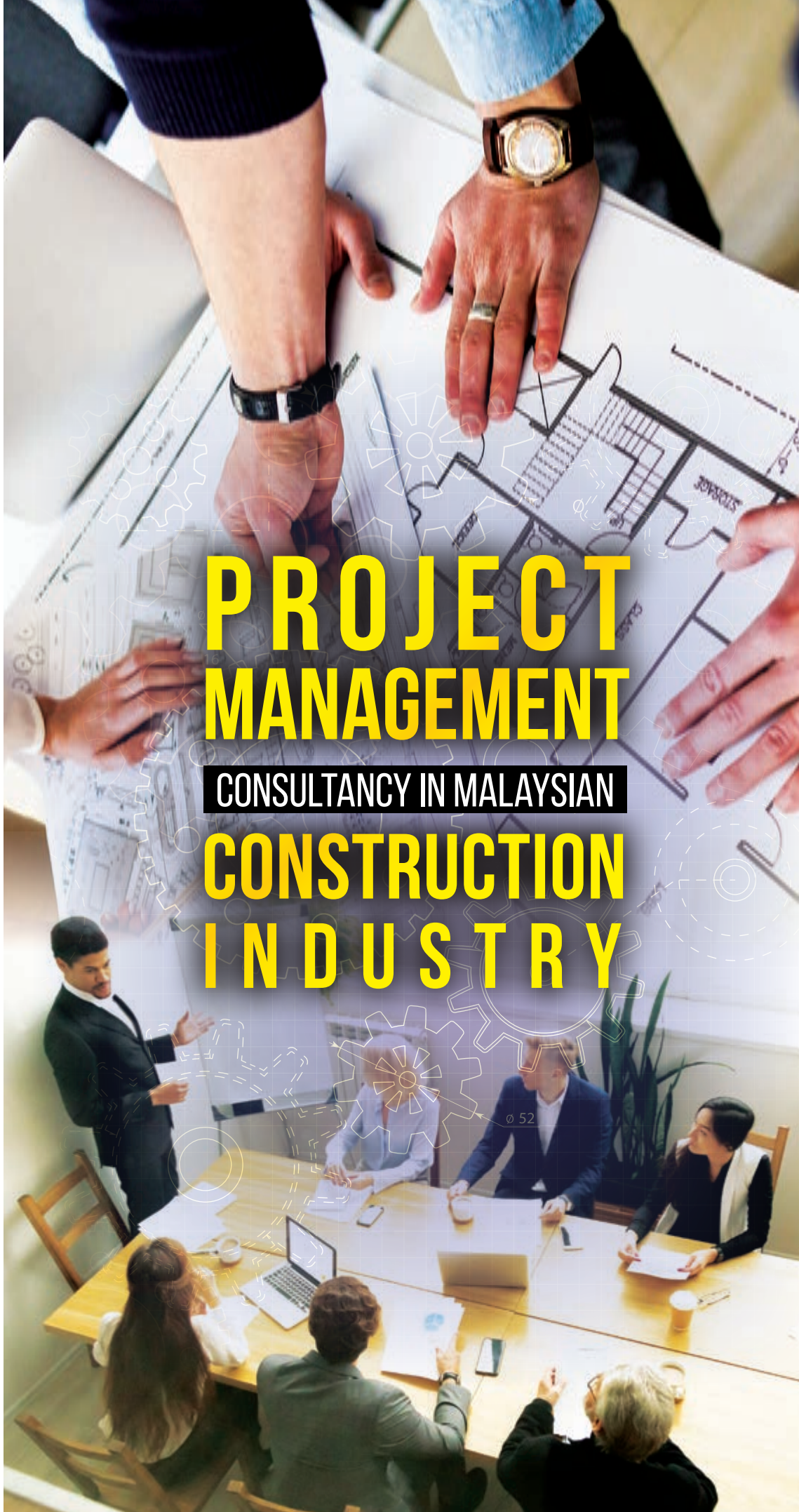
The Institution of Engineers, Malaysia

JURUTERA

The Monthly Bulletin of The Institution of Engineers, Malaysia
KDN PP 1050/12/2012 (030192)
ISSN 0126-9909



PROJECT MANAGEMENT

CONSULTANCY IN MALAYSIAN CONSTRUCTION INDUSTRY

THE MONTHLY BULLETIN OF THE INSTITUTION OF ENGINEERS, MALAYSIA

JURUTERA

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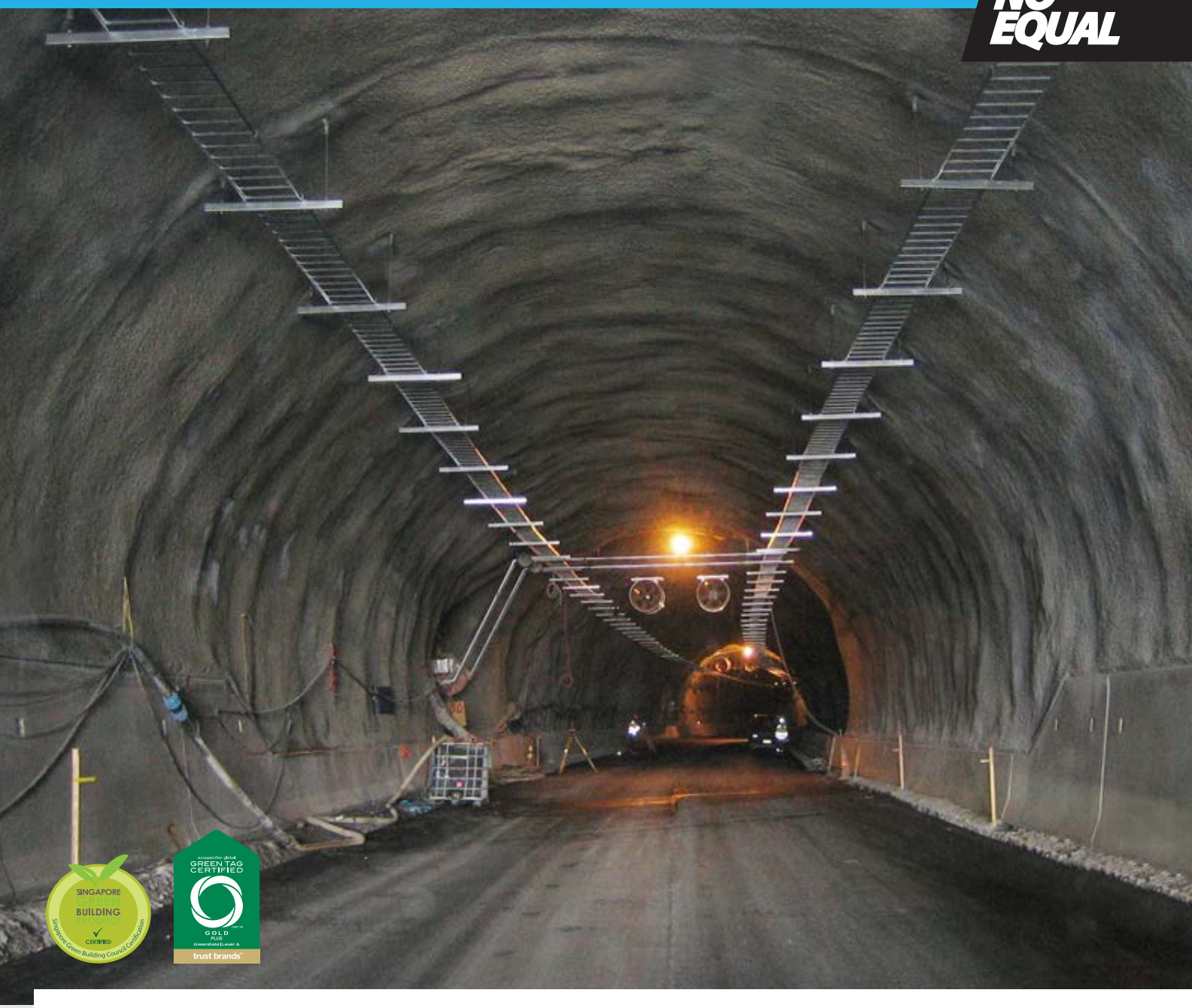

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Number 10, OCTOBER 2019 IEM Registered on 1 May 1959

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cover note

ESSENTIALS OF PROJECT MANAGEMENT

by Ir. Wong Khien Ngie
Chairman,
Project Management Technical Division

According to A Guide To The Project Management Body of Knowledge, PMI, 2000 Edition, "project management is the application of knowledge, skills, tools and techniques to a broad range of activities to meet the requirements of a particular project".

In meeting the requirements and needs of stakeholders, every project has to effectively manage four basic constraints: Scope (project), schedule (time), budget (cost) and quality. As success depends on the leadership, communication, negotiation, planning, risk management, scheduling, budgeting skill and knowledge of a project manager, the consideration of project managers for these constraints is essential to develop a plan and all necessary processes to keep them in balance towards the final goal.

The knowledge, skills, tools and techniques of project management encourage easier collaboration, using a common language and shared expectations about what to expect from project managers, team members and other key stakeholders. Project environments will be more efficient and will contribute to better business outcomes via the effective and efficient implementation of project management. ■

editor's note

by Ir. Razak Yakob
Bulletin Editor

Salam & Hello All IEMers,

As I am writing this, the haze is horrendous. The Air Pollutant Index has reached a level where schools are closed in many parts of Malaysia. It got me thinking. What are we, the engineers, doing about it? I know I am not doing anything since my discipline has nothing to do with it. Not my problem? Maybe IEM can spearhead an initiative to combat the problem which plagues us year after year, like an annual expectation of "winter is coming".

Truth is, every bit of contribution counts, even if it seems trivial. Fewer cars on the road will help reduce the pollution, so take public transportation instead. Drink lots of water and try not to get sick as this will help ensure our resources can be used for more serious medical cases. Sometimes we chase after big stuff but forget the small stuff, which also matters. Please keep contributing to the betterment of our lives.

This month's focus is the Project Management Technical Division with Project Management Consultancy in the Malaysia Construction Industry. Hope you find the articles beneficial and able to propel your career to the next level. Managing projects is hard and the quantum of complexity goes exponentially with the size of the contract.

We welcome any feedback you have on *JURUTERA* and IEM in general. We would like to hear from you. On behalf of the Editorial Board, we wish all Happy Deepavali.

Let's continue to engineer our country to greater heights! ■

PROJECT MANAGEMENT CONSULTANCY IN MALAYSIAN CONSTRUCTION INDUSTRY

Project Management Consultancy in the construction industry is increasingly important as projects get bigger and more complex, requiring greater control and monitoring from start to finish. Through IEM's Project Management Technical Division, *JURUTERA* talks to the Minister of Works, Y.B. Tuan Baru Bian, to find out more about the Ministry's views on PMC in ensuring successful completion of projects.

The undertaking of projects such as construction of roads, bridges, railways and various types of buildings, requires not only knowledge and expertise in engineering and construction but also know-how and competency in managing such projects from inception to completion.

Proper management at every stage of a project's life-cycle can help ensure efficiency, timely trouble shooting and successful completion of the project in terms of meeting the set goals of constructors, developers and their clients. Experts in Project Management Consultancy (PMC) oversee various processes, including Time-Cost-Risk-Scope-Quality-Resource.

PMC also deals with challenges and issues including those affecting design and constructability, inter-contractor co-ordination, engineering and safety issues. A well-organised PMC approach also looks at the adoption of methods for higher management like well-timed progress review, training in various fields, design-construction interface, quality audits and quality diligence and delivery.

Therefore, it involves a planned series of activities, including overall planning, co-ordination, monitoring and control of a project from start to finish so as to achieve functionally and financially viable projects which will be completed on time, within authorised cost and to the required quality standards. PMC services are also packaged in synchronisation with other specific requirements of clients.

The Malaysian Government had adopted the Project Delivery Partner (PDP) concept, which the engineering fraternity views as having similarities to PMC, in the construction of the Pan Borneo Highway which stretches over 2,000 km through Sabah and Sarawak. Government infrastructural projects come under the purview of the Ministry of Works.

The Minister of Works, Y.B. Tuan Baru Bian, says the government has not been practising PMC since 2012/13, in line with the Government's procurement and project implementation policy.

Tuan Baru Bian, Minister of Works and Selangau MP and Ba Kelalan Assemblyman, Sarawak.

"Although there are similarities between PMC and PDP, there are also significant differences in terms of liability, roles and financial consideration," he says.

"Apart from delivering the project within the pre-determined Key Performance Indicators (KPI) of cost, quality and time, PDP also carries certain liabilities and responsibilities pertaining to the project. For the PMC model, the appointed PMC is tasked with managing the delivery of the project but its performance is not necessarily reflected in the fees it receives."

He says that taking into consideration other Government projects that also use the PDP model such as Mass Rapid Transit (MRT) Line 1 and 2, there are mixed results as choosing the right model is just one factor that determines a project's success. Other factors should also be taken into account, including the contractor's performance, project governance and administration as well as availability of funds.

NEED FOR EFFICIENT PROJECT MANAGEMENT MODELS

Tuan Baru admits that project management is a new area that he is still learning and exploring. He says it is the art of directing and co-ordinating human and material resources throughout the life-cycle of a project by using modern management techniques to achieve pre-determined objectives of scope, cost, time, quality and participation satisfaction.

"Every construction project is different and unique, and demands the full attention, professionalism and energy of the project team. Due to the rapid expansion in our construction industry, efficient project management models are needed in terms of performance and quality of work to meet construction project goals and objectives," he says, emphasising that with rapid changes, the industry needs to keep ahead of development of technology and different approaches of project management in the construction field occurring all over the world.

"The approaches encompass the three major divisions of construction resources: Human Capital, Technology and Business & Management skills. In construction management, some of the best concepts of management have been adopted but as the world becomes more competitive, these need to be revised."

The revision is included in the Government's reviewed Construction Industry Transformation Programme (CITP), the national agenda to transform the construction industry to be highly productive, environmentally sustainable and focused on safety and quality standards.

The initiatives on quality, safety and professionalism are still the core agenda in promoting the Quality Assessment System in Construction, which is a system to measure and evaluate the workmanship and quality of building construction based on Construction Industry Standards. It also regulates conformance to material standards, Construction Design Management, reduction of worksite fatalities, construction projects managed by accredited construction managers and ensures adequate procedures by construction-related companies.

"The Ministry of Works has tabled the relevant paper to the Cabinet, which has agreed for CITP initiatives to be the main reference for all construction players. The Ministry is also moving towards digitalising the construction industry with a focus on upgrading and optimising productivity in the construction

industry through technology advancement, digitalisation and innovation," says Tuan Baru.

The Ministry, through its agency, the Construction Industry Development Board (CIDB) is in the midst of establishing the 4th Industrial Revolution (4IR) roadmap for the construction industry, which will be completed by January 2020. This will provide clear direction for industry players and streamline future programmes related to 4IR, in particular, Building Information Modelling (BIM), Highway Information Modelling, Industrialised Building System, E-Works and National Construction Industry Centre.

"It is not merely about the development of mechanisms, software and robotics but also to provide data, real-time information and a more efficient system that will connect the Ministry and its agencies as well as other relevant stakeholders so as to bridge the aspiration of establishing transparency and connectivity between ministries, stakeholders and the end-users," says Tuan Baru. "However, public awareness on the importance of achieving efficiency, cost-effectiveness and safe construction is still in its infancy. There is also an awareness-action gap, where those who understand the challenges may not necessarily change their behaviours or actions. Our industry is still lacking facility management players, capacity, technology, experience and capability."

HOLISTIC CONSTRUCTION PROCESS

In view of the above, and in line with the 12th Malaysia Plan, the Ministry of Works is looking forward to optimising the use of resources (capital, human and technology) and supporting organisations' goals and customers' requirements by having new focus areas, such as facility management.

Tuan Baru says his Ministry is currently working on a holistic chain of construction processes to assist in planning, designing and managing all cycles of new constructions, as well as improving cost estimates, time management and preliminary planning which determines many factors, including how an activity's tangible fixed assets can best support efforts to achieve the desired goals of a project.

The Ministry also aims to establish a leading body or an institute pertaining to facility management with the task of formulating and developing new regulations and action plans in construction projects. This institute will emphasise the utilisation of BIM in all new construction projects and hold facility management and restoration-skill training and courses.

NO SINGLE REMEDY

Commenting on projects that experience failure in terms of time, cost and quality, despite initiatives by the Government and the private sector to promote good practices of project management through various bodies, Tuan Baru says project management is not the magic solution to all ailments in the construction industry.

"It is not a single remedy to fix all problems. In fact, project management is only the application of specific processes, knowledge and skills, techniques and tools, as well as inputs and outputs that project managers use to meet goals and deliverables. As such, if the industry is not producing enough highly skilled workers, competent contractors, reliable suppliers and knowledgeable technical professionals, then project management is not the answer and project delivery objectives will continue to suffer," he says.

Similarly, if the industry is not creating conducive working environments where adoption of appropriate construction technologies, processes and techniques are continuously fostered, then project delivery will also suffer, despite adopting project management practices or models.

OUTSOURCING PMC SERVICES

For construction projects on very large scales with a wider range of specialty and complexity, Government technical agencies may not have the resources to cope. Tuan Baru says this has only exacerbated the drive towards divestment of some of the functions of the various agencies, adding that in the past, some Government construction programmes have been implemented through the appointment of project management consultants.

However, he laments the unsatisfactory results of the implementation of the projects, which resulted in the discontinuation of the practice of employing PMC in 2012. One of the reasons for the failure was that Government projects were not procured in the same way as private projects.

There are specific regulations and restrictions imposed by Government agencies for the purpose of aligning with prevailing public policies. These restrictions are rather wide, ranging from restrictions on the procurement of imported products to restrictions on the scope of work for the purpose of cost control. Outsourcing, however, is still being practised, on a case-to-case basis.

IMPROVING PRACTICES OF PROJECT MANAGEMENT

Tuan Baru acknowledges that there is still room for improvement in project management practices in the construction industry. He cites the high-risk nature of construction works, which also consume large amounts of resources, as a factor that necessitates better application and utilisation of project management practices.

If properly utilised, he says, project management practices will result in concrete benefits in all aspects of project implementation. In his view, there are currently many industry players who are still oblivious to the benefits of employing project management principles. Often, they are forced to implement project management because of contractual requirements rather than the desire to improve the efficiency of their work or to realise added values in their work practices. Thus, he notes that despite having spent considerable sums of money to implement project management principles, the local construction industry is yet

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to obtain the full benefit of project management initiatives.

MOTIVATION TO PRACTICE PROJECT MANAGEMENT

Where public development and construction projects are concerned, Tuan Baru says the Ministry's Project Department applies project management principles to ensure the successful completion of projects.

On the question of whether the Government provides incentives to encourage private developers to implement similar principles, he says there must be some amount of responsibility in the private sector when developers undertake construction works for both the public and private citizens.

"There is a limit to the level of intervention by the Government. In fact, the industry itself should embark on a voluntary and self-regulated code of conduct when dealing with issues of quality expectation and value-adding for their private clients. The Government is of the opinion that the value created by implementing project management is, in itself, a sufficiently strong incentive to motivate all industry players to adopt it," he says, adding that the Government is indirectly encouraging the adoption of project management by unilaterally mandating it in all Government projects.

The desired outcome is for industry players involved in these projects to benefit from the experience and to see for themselves the advantages of adopting project management in their own practices.

STANDARDS & CERTIFICATION OF PROJECT MANAGEMENT

Tuan Baru agrees that successful completion of projects is more likely to be achieved if certified project management is employed. He says the Public Works Department (PWD) had developed a complete Competency Standards for Project Management for use in the public sector since 2011. Under this initiative, three levels of project management competency certifications, namely Qualified Project Practitioner, Registered Project Manager and Registered Programme Director, have been carried out.

Tuan Baru Bian (seated, centre) flanked by committee members of IEM's Project Management Technical Division (PMTD) Ir. Faizal A. Sanusi (right) and Ir. Tan Ban Loong (left) and other members of PMTD and staff of the Ministry of Works.

"At the moment, the Government has no intention to mandate the employment of certified project managers in any project, public or private. However, voluntary adoption by the PWD has been carried out on selected high-profile public projects. On the other hand, CIDB has been pushing hard for mandatory appointment of certified construction managers for projects costing more than RM50 million," he says.

CIDB is expected to regulate and enforce the requirement through the licensing of contractors. Under CITP, projects above RM50 million must be managed by certified project managers.

ENHANCING PROJECT MANAGEMENT COMPETENCY

Tuan Baru says it is the Government's responsibility to preserve public safety in the construction industry, so various professional boards have been established under the ambit of the Ministry of Works to register and regulate the conduct of relevant technical practitioners.

He says: "At the moment, the Government is of the opinion that it is not necessary to enhance project management competency in the form of mandatory registration of practitioners through an Act of Parliament, similar to the Registration of Engineers Act."

However, he adds, project management practitioners are encouraged to form collaborative alliances with professional boards, such as CIDB or other agencies under the auspices of the Ministry of Works, if they think it is useful.

Besides having expert resources and experience in implementing project management, competent and effective project management consultants must also have successful track records and be registered with accredited bodies which also certify them as project managers.

As for the certification of project managers, the level of certification can determine the competency of the personnel. There are certification bodies like the internationally recognised Project Management Institute while CIDB and PWD also run

similar programmes to certify project managers nationally.

FACTORS FOR SUCCESSFUL PROJECT MANAGEMENT MODEL

"In my opinion, a successful project management model is one that integrates technical, financial, environmental and social factors as well as one that will realise the specific outcome of the projects," says Tuan Baru. He also stresses on the need for a strategic model to connect these elements within a project management framework. Hence the project manager's main role is to ensure the delivery of the project and work on behalf of the project owner.

"PMC services can be internal or outsourced as long as the project owner is in control and more likely to work with their project management consultants as well," says Tuan Baru.

He also points out that the deliverables of the consultants mainly revolve around successful project delivery, comprising performance management, stakeholder management and resource management, among others. The exact deliverables should be agreed upon by the project owner and their project management consultants.

RESPONSIBILITY & ACCOUNTABILITY FOR PROJECT DELIVERY

PMC is the extended arm of the client, so Tuan Baru says project management consultants hold the responsibility to deliver the project as intended by their clients.

"In my view, project management consultants can be involved in the selection of consultants and contractors to serve as advisors to the clients and their roles must be tied with clear Terms of Reference and, of course, with the proper mechanism to monitor and control. The need for construction industry players to employ certified and registered project managers to oversee PMC must be emphasised," he says.

Since project management consultants only act on behalf of the clients, he believes they should not have full authority because the clients have the bigger accountability to ensure the success of their business plan, which is carried through the project implementation.

"However, it will be an added advantage if project management consultants can play an additional role as project mentors and drive their clients to achieve successful projects," he adds.

THE WAY FORWARD

Tuan Baru says he is open to having relevant parties such as IEM and others in the private sector, deliberate and collaborate with his Ministry and its agencies in solving issues and enhancing the implementation of project management approach in the construction industry.

"I am convinced there are good prospects in the proper implementation of project management. Come in to exchange ideas and convince others with your experience, expertise and success stories. The way forward is also for professional bodies like IEM to conduct project management training, knowledge-sharing sessions and structured workshops as well as suggest ways to put ideas/plans in motion and place every aspect of project management in proper perspective," he says.

"While I believe that industry players must self-regulate in managing projects, I also realise the importance of having the necessary regulations and laws as I am concerned about liability and accountability in delivering projects. With legislation in place, we will know who can be held responsible and accountable when something goes wrong with project implementation."

Regulations and legislation are a means to control and everyone – both in the public and private sectors – must abide by these. Having said this, he stresses that everyone along the line is responsible, from project owners and consultants to contractors and sub-contractors.

"At the end of the day, everyone shares the responsibility for the success or failure of a project," he concludes. ■

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FEATURE

DELAYS IN MALAYSIAN GOVERNMENT PROJECTS: LEARNING FROM PROJECT MANAGEMENT FAILURE

Nor Aida Idrus

Ir. Assoc. Prof. Dr Syuhaida Ismail

Ir. Faizal A. Sanusi

The Malaysian government is the largest client in the local construction industry, focusing mainly on the building of public infrastructures. It has a development expenditure allocation of RM260 billion under the 11th Malaysia Plan with the total commitment of RM875.2 billion from the 1st Malaysia Plan to the 10th Malaysia Plan.

Despite the huge allocation, delays in government projects due to poor project management are serious problems that contribute to 10.3 per cent of project costs; 89% of construction projects in south/central Peninsular Malaysia claimed that government projects are facing cost overrun at 5-10% of the contract price, which is acceptable since a maximum 15% is normally allocated in the variation clause by the clients.

On the contractor's side, delays in projects completion entail additional cost from extended insurances, extended use of site office overheads, labour and equipment, standby costs and other intangible costs, namely opportunity cost, which are claimable from the clients.

So, aimed at investigating causes of delay, questionnaire surveys have been carried out on 100 clients, monitoring agencies, consultants and contractors in delayed government projects, where the findings are validated by 5 subject matter experts (SMEs) in the area of delay and government projects. This article is timely in not only assessing the causes of delayed government projects but also in offering recommendations for improving project management practices towards on-time government project delivery.

DELAYS IN GOVERNMENT PROJECTS

Delay is time overrun or extension of time to complete a construction project beyond the date agreed upon by the contract parties because actual progress is slower than planned. The Malaysian government defines delays as exceeding one month or 10% late from the expected schedule.

The number of government projects experiencing delay in the 11MP are significantly increasing due to weaknesses in project management during planning and implementation phases. In 2018, ICU reported that 61 government projects were delayed due to project management failure in planning and implementation phases and 87% in the construction phase.

THE CAUSES

Delays in government projects is common in many countries worldwide. Researchers in Malaysia, Slovenia, Jordan and Norway studied the causes of such delays in their respective countries and found 26 causes which they grouped into three key causes: Due to contractors (9), due to clients (5) and due to consultants (12). These 26 causes were transformed into questionnaires for data collection.

FINDINGS & DISCUSSIONS

The questionnaire analysis (see Table 1) showed an increase in the number of causes of delay, with the additional causes indicated by the asterisk symbol (*). The increase was from 9 to 13 causes due to contractors, from 5 to 6 causes due to clients and from 12 to 16 causes due to consultants. For causes due to contractors, "financial difficulties" was marked most important, followed by "problem of subcontractor" and "shortage of labour".

Delays due to contractors' financial difficulties were caused by the inability to secure and/or sustain operational cashflow for the project. This was attributable to the tender evaluation process flaw by the client. On the contrary, "construction mistakes" was considered the least important, followed by "shortage of materials" and "construction defective works". Since "construction mistakes" – these ranged from bad construction sequence planning to making good of defective works or off-specification works stemming from poor management and/or skilled workmanship – were claimed as the least important, it was suggested that the contractor's competency in the construction of Malaysian government projects, that was associated with minimal "construction mistakes", was not an issue that caused delay. This suggestion was also in line with the results of least important "construction defective works", which demonstrated that repetitive works due

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to these construction mistakes were claimed to be not important but if these happened, it would eventually affect the project schedule especially if the works are on the critical path or near critical path.

For causes due to clients, "financial difficulties" remained the most important, leading to late payments and impacting the contractor's work progress, followed by "changes in design" and "slowness in decision making". "Failure to provide required construction site" and "improper scheduling" were chosen as the least important.

However, the causes due to consultants showed an interesting outcome. These causes were put into 3 groups after the Exploratory Factor Analysis (EFA) using the Principal Component Analysis (PCA) extraction method combined with Oblimin with Kaiser Normalisation rotation: Sub-factor 1 (planning and coordination issues) with 6 causes, sub-factor 2 (productivity issues) with 6 causes and sub-factor 3 (knowledge and expertise issues) with 4 causes.

The results showed that for sub-factor 1, the most important was "poor communication with other stakeholders", followed by "poor coordination with other stakeholders" and "poor site management". "Poor communication" was expected as the most frequent problem in construction was referred to as communication problems (Emmerson, 1962; Higgin and Jessop, 1965; Latham, 1994 and DETR, 1998) due to the specific characteristic of the construction industry that formed a complex communication environment (*Hoezen et al., 2006*).

For sub-factor 2, "slow approval of shop drawings", "consultant team non-productivity" and " inadequate experience of consultant" were selected as the top 3 most important.

In addition, sub-factor 3 demonstrated that the most important was "changes in designs", followed by "changes in specifications" and "slowness in approving major changes in scope of work". "Changes in designs" was in line with *Hamzah et al., (2017)*, which indicated that design changes not only caused project delay but also cost overruns. See Table 1 for the results.

Table 1: Results of data analysis on the causes of delayed government projects in Malaysia due to contractors, clients and consultants

PRIORITY	CAUSES OF DELAY	VARIABLE	RII (%)
1	Financial difficulties		88.20
2	Problem of subcontractor		80.40
3	Shortage of labours		79.80
4	Poor site management*		79.40
5	Inadequate experience		78.80
6	Poor coordination with other stakeholder*		78.60
7	Poor communication with other stakeholder*		78.40
8	Poor project management practices*		78.00
9	Delay of delivery materials on site		75.80
10	Labour non-productivity		73.60
11	Construction defective works		73.40
12	Shortage of materials		70.60
13	Construction mistakes		69.00

Table 1: Results of data analysis on the causes of delayed government projects in Malaysia due to contractors, clients and consultants

PRIORITY	CAUSES OF DELAY	VARIABLE	RII (%)
	Due to Clients		
1	Financial difficulties		75.00
2	Changes in design		75.00
3	Slowness in making decision		74.80
4	Improper scheduling*		74.40
5	Failure to provide required construction site		69.80
6	Slowness in progress payment		69.40
	Due to Consultants		
1	Poor communication with other stakeholders	Sub-factor 1	81.00
2	Poor coordination with other stakeholders	Sub-factor 1	81.00
3	Poor site management	Sub-factor 1	80.60
4	Improper scheduling	Sub-factor 1	80.00
5	Improper planning	Sub-factor 1	79.60
6	Poor project management practices*	Sub-factor 1	77.60
7	Changes in designs	Sub-factor 3	77.20
8	Changes in specifications	Sub-factor 3	77.00
9	Slowness in approving major changes in scope of work	Sub-factor 3	74.40
10	Slow approval of shop drawings	Sub-factor 2	72.00
11	Consultant team non-productivity	Sub-factor 2	71.80
12	Inaccurate estimated project cost*	Sub-factor 3	71.80
13	Inadequate experience of consultant*	Sub-factor 2	71.40
14	Incomplete document	Sub-factor 2	71.20
15	Slow preparation of shop drawings	Sub-factor 2	70.80
16	Shortage in consultant team*	Sub-factor 2	64.20

* Newly added causes; ** Sub-factor 1 = Planning and coordination; Sub-factor 2 = Productivity issues; Sub-factor 3 = Knowledge and expertise issues

Based on these 35 causes, the five SMEs have suggested the following improvement measures (Table 2).

Table 2: Overall results of improvement plans in in managing government project delays

PRIORITY	IMPROVEMENT PLANS
1	Contractor should have strong financial resources
2	Contractor should have good skills in project management
3	Contractor should appoint a capable subcontractor
4	Consultant should have good coordination
5	Contractor should provide sufficient workers on-site
6	Client should appoint a capable contractor
7	Client should have a good project financial plan
8	Consultant should have good communication
9	Contractor should have a proactive materials delivery approach
10	Consultant should identify the possible risks in the early phases as part of risk management practices
11	Contractor should provide adequate trainings to the workers
12	Payment made by client should be on-time within the contractual provisions
13	Client should ensure construction site is ready and accessible before project starts
14	Consultant should have good skills in project management
15	Contract awarding mechanism should be made transparent
16	Client should not impose major changes during construction
17	Consultant should clearly define the scope in the design brief.
18	Contractor should have good estimation of materials quantity
19	Consultant should produce complete document in planning stage.
20	Consultant should do site inspection on time
21	Consultant should have site management plan schedule
22	Consultant should appoint staff members with adequate technical knowledge and expertise
23	Consultant should provide a reasonable project schedule duration
24	Administrative decisions by client should be effective
25	Contractor should have skilled workers
26	Consultant should have sufficient team members
27	Government shall promote contractor to use modern technology
28	Consultant should approve shop drawings based on project schedule
29	Consultant should prepare shop drawings based on project schedule
30	Consultant should approve major changes in scope of work on time
31	Consultant should not impose major changes in specification during construction
32	Consultant should not impose major changes in design during construction

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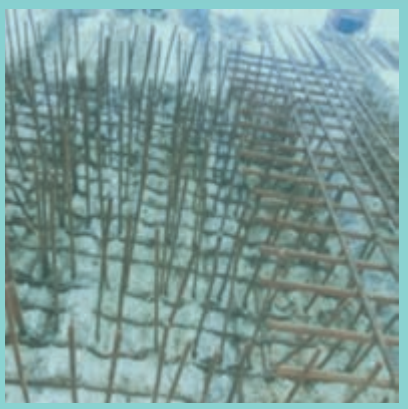

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In general, the improvement plans suggested are aligned to the need for a rigorous evaluation exercise to select and appoint highly competent contractors and an effective coordination role to be undertaken by consultants in ensuring effective and efficient project management practices in the government projects in Malaysia towards on-time project delivery.

CONCLUSION

Causes due to contractors, clients and consultants are the main causes of government projects delays in the country, where the consultant and client are ranked first and second respectively as they are involved in all phases of the project life-cycle, whereas the contractor comes in later at the implementation phase.

There are also 32 improvement plans which can be translated into specific strategies towards on-time projects delivery via effective and efficient project management practices. Based on these improvement plans, this article suggests that the implementation of good project management involves a combination of competent people who are knowledgeable and have practised such knowledge successfully and having a set of project management tools and techniques (e.g. the assorted Information Communication Technology or ICT applications) in place, which is operating within a conducive culture that fosters the inclusiveness of project management values within the government project environment.

While it may be a challenge to have people at all levels who utilise project management knowledge, skills, tools and techniques, it may be sufficient as a start to initialise this work culture at the top echelons of the construction organisation with external augmentation under a structured plan to successful integrate the said values.

ACKNOWLEDGMENT

The authors would like to express their gratitude to the Ministry of Education, Universiti Teknologi Malaysia (UTM) and Research Management Centre (RMC) of UTM for providing the financial support under cost centre No. R.K130000.7740.4J290. ■

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Ir. Faizal A. Sanusi *the Principal Consultant of Centaur Project Controls Sdn. Bhd., has over 30 years' experience in project management. He was Chairman of Project Management Technical Division of IEM in 2012.*

ERRATA

Error on Forum titled **"Technical Site Visit to Sungei Besi Tunnel"** by **Ir. Chong Chi Koong** published in JURUTERA 2019, September issue, Page 35.

The paragraph should read: *"During the site visit, the participants raised many pertinent questions that were addressed by representatives from PAAB, CSRK, the main contractor and subcontractor on site "*.

The error is much regretted.

IEM COUNCIL ELECTIONS 2020/2021

NOTICE ON NOMINATION PAPERS FOR COUNCIL ELECTION SESSION 2020/2021

A notice inviting nominations for the Election of Council Members for Session 2019/2020 would be posted on the IEM Notice Board and IEM website from **16 November 2019** for the information of all Corporate Members of IEM. Thereafter, following the close of nominations on **11 December 2019**, the election exercise will proceed. All Corporate Members residing overseas are requested to take note of the requirements of the Bylaw, Section 5.12, as shown below.

The voting paper shall, not less than twenty eight (28) clear days before the date of the Annual General Meeting, be sent by post to all Corporate Members residing in Malaysia and to any other Corporate Members who may, in writing, request to have the paper forwarded to him. The voting paper shall be returned to the Honorary Secretary in a sealed envelope so as to reach him by a specified date not less than seven (7) days before the Annual General Meeting.

Voting papers will be posted out by **20 February 2020**.

Any Corporate Members residing outside Malaysia, who wish to receive voting papers, are advised to write to the Honorary Secretary on or before 10 January 2020.

Thank you.

Election Officer, IEM

CONGRATULATIONS

Congratulations to **Y.Bhg. Dato' Seri Ir. Dr Zaini bin Ujang** on receiving the Tokoh Maal Hijrah, Peringkat Kebangsaan 1441H/2019M award from Unit UTM Alumni, Universiti Teknologi Malaysia on 1 September 2019.

Congratulations to **Y.Bhg. Academician Dato' Ir. Emeritus Prof. Dr Chuah Hean Teik** who was awarded Panglima Setia Mahkota (PSM) with the title, Tan Sri, in conjunction with Hari Keputeraan Yang di-Pertuan Agong on 9 September 2019.

Congratulations to **Y.Bhg. Datin Paduka Ir. Dr Siti Hamisah Tapsir** who was awarded Panglima Jasa Negara (PJN) with the title, Datuk, in conjunction with Hari Keputeraan Yang di-Pertuan Agong on 9 September 2019.

Congratulations to **Y.Bhg. Dato' Ir. Ahmad Asri Abdul Hamid** who was awarded Panglima Jasa Negara (PJN) with the title, Datuk, in conjunction with Hari Keputeraan Yang di-Pertuan Agong on 9 September 2019.

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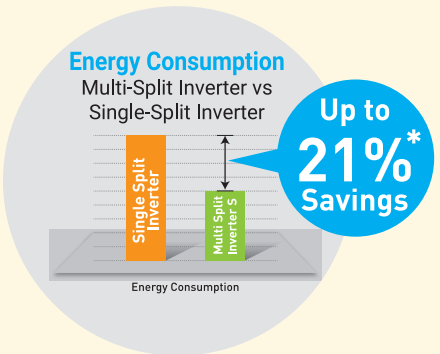

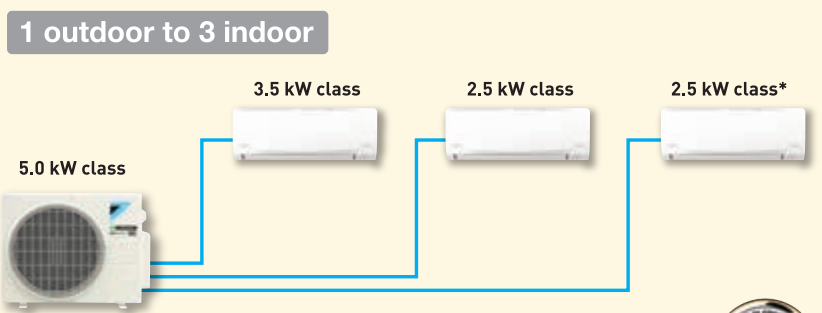

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This year, the 37th edition of Conference of AFEO was held in Jakarta, Indonesia, from 11 September to 14 September 2019. CAFEO37, hosted by Persatuan Insinyur Indonesia (PII), was officiated by the President of Indonesia, Joko Widodo and witnessed by 7 ASEAN Ministers. The ceremony attracted participation of more than 1,000 engineers and professionals related to the engineering industry.

As promised, PII staged a spectacular opening ceremony where the participants had the privilege to witness Indonesia's pride, President Joko Widodo receiving the AFEO Distinguished Honorary Patron Award, one of the most prestigious and highest AFEO award. The award may only be conferred to reigning heads of state and heads of government of acknowledged eminence and high standing who have rendered very substantial, outstanding services and contribution to the engineering profession, and/or the ASEAN Community.

The award was also conferred on Y.B. Tuan Baru Bian, Minister of Works, Malaysia, while Honorary Fellow awards were conferred on Y.Bhg. Dato' Seri Mohammad Nizar Jamaluddin, EXCO Member of Perak State Assembly and Y.Bhg. Datuk Ir. Ahmad 'Asri bin Abdul Hamid, Chief Executive Officer of Construction Industry Development Board, Malaysia.

Also present at the award ceremony were engineers, industry leaders, academicians and professionals from ASEAN countries including Y.Bhg. Tan Sri Ir. Prof. Dr Mohd Zulkifli bin Tan Sri Mohd Ghazali and Y.Bhg. Datuk Wira Ir. Md Sidek Ahmad representing the Board of Engineers, Malaysia.

Themed "The Beacon for Sustainable Development" the conference highlighted related topics such as Transportation and Logistics, Information and Telecommunication, Education and Capacity Building, Sustainable Cities and Power, Electrical and Renewable Energy.

Keynote addresses, case study presentations and panel discussions on engineering for sustainable development in the programme enabled the participants to have a greater insight into the issues concerning the industry in ASEAN.

Two exhibition shows were also organised together with the conference namely the Indonesian Engineering Exhibition and Electrical, Power and Renewable Energy Exhibition. The Malaysia Pavilion at the Electrical, Power and Energy Exhibition spearheaded by IEM showcased the products and services of 14 Malaysian exhibitors. Supported by MATRADE, the IEM - Malaysia Pavilion was officiated by Y.B. Tuan Baru Bian and witnessed by all the dignitaries led by IEM President Ir. David Lai Kong Phooi, accompanied by Y.Bhg. Dato' Seri Mohammad Nizar Jamaluddin,

THE BEACON FOR SUSTA
CAF

ASEAN Handshake after s

Ir. Yau Chau Fong briefing the Minister on the IEM-Malaysia Pavilion

Official launching of IEM-Malaysia Pavilion by Y.B. Tuan Baru Bian

ASEAN Handshake at Opening Ceremony CAFEO37

AINABLE DEVELOPMENT - EO37

igning the Jakarta Declaration

AFEO Hon. Member award conferred to Malaysian representatives

Y.B. Tuan Baru Bian visiting the Malaysian Exhibitor's Booths

Delegates from CAFEO37's visit to AHA Centre

PRESIDENT'S CORNER

Y.Bhg. Datuk Ir. Ahmad 'Asri bin Abdul Hamid and MATRADE Director of Construction and Business Service Section Y.Bhg. Datin Rusiah Mohammad and Y.Bhg. Dato' Azmir Merican. Y.B. Tuan Baru Bian was given a conducted tour of the Malaysia Pavilion where the exhibitors presented a short introduction about their companies.

MATRADE played an important role in the coordination of the Malaysia Pavilion by arranging One to One Business Matching sessions and visits to their trade facilitation office in Jakarta. The Malaysian exhibitors received financial support from MATRADE via the MDG grant which enables them to claim the expenses incurred for the exhibition from MATRADE. IEM will continue to work with MATRADE at future CAFEOs to assist Malaysia engineering companies in promoting export of goods and services to ASEAN. This initiative by IEM was introduced in 2018 and CAFEO37 marked the second consecutive year that IEM had worked hand-in-hand with MATRADE. IEM is pleased to inform that MATRADE would also be supporting CAFEO38 in Da Nang, Vietnam in 2020.

During the exhibition, a two-hour pitching session titled "Fast-Paced Business Introduction – A Sneak Peek from the Experts" saw companies briefing the audience on the products and services they provided. A technical visit to the ASEAN Coordinating Centre for Humanitarian Assistance (AHA Centre) in Jakarta was the focus of the second day of the conference. The AHA Centre is an inter-governmental organisation which aims to facilitate cooperation and coordination among ASEAN Member States and with the United Nations and international organisations for disaster management and emergency response in ASEAN region.

The normal business of the conference, which is the AFEO Governing Board Meeting, was held on 13 September 2019 followed by the Jakarta Declaration and gift exchange ceremony marking the end of the three-day official event. The AER Certificate Presentation ceremony was held with newly admitted members to the ASEAN Engineers Register receiving their medals and certificates from Y.Bhg. Dato' Andy Seo Kian Haw, the AER Head Commissioner.

The Young Engineers and Women Engineers of AFEO too had their meetings where they presented the country report of each member organisation. Besides that, several Working Groups set up under AFEO also had their meetings to update on the latest development pertaining to the issues under their purview such as Sustainable Cities, Engineering Education and Capacity Building, Energy, Mobility of Engineers, Transportation and Disaster Preparedness as well as Environment.

In conjunction with CAFEO37, the Disaster Preparedness Working Group organised a seminar that was well attended by over 100 participants, comprising members of the AFEO working groups and AER Steering Committees. After 3 days of intense meetings, conferences and high profile encounters, the men dressed up in smart bow ties, ladies dazzled in their beautiful evening gowns letting their hair down to enjoy an evening filled with spectacular shows and tasty food, at the Awards Night and Closing Ceremony. Honorary Membership awards such as AFEO Honorary Fellow and Honorary Member were presented to those who had contributed to the engineering industry in their respective countries and ASEAN. The night ended with the handing over ceremony for next year's CAFEO which will be held in Da Nang, Vietnam. ■

FEATURE

LEADERSHIP IN MALAYSIAN GOVERNMENT ORGANISATION

Kamal Mustafa

Khairul Zahreen Mohd Arof

Ir. Assoc. Prof. Dr Syuhaida Ismail

Performance of an organisation is the action or process of carrying out or accomplishing the improvement acts of an organisation via knowledge sharing, organisational agility and leadership style. In general, there are various leadership styles in managing an organisation, such as transformational leadership, transactional leadership, servant leadership, autocratic leadership, laissez-faire leadership, democratic leadership, bureaucratic leadership, charismatic leadership and situational leadership (see Table 1).

Table 1: Types of leadership style

Leadership style	Description
1. Transactional	Leader focuses on the management of the organisation
	Leader focuses on procedures and efficiency
	Leader focuses on working to rules and contracts
	Leader manages current issues and problems
2. Laissez-faire	Leader allows one or more people in the decision-making
	Leader maintains the final decision-making
3. Transformational	Leader acts rationally depending on the situation and environment
4. Servant	Leader encourages, supports and enables people to fulfil their full potential and abilities
	Leader helps people achieve their goals
	Leader works for the people
5. Democratic	Leader allows people to make their own decisions
	Leader is still responsible for the decisions that are made
	Leader allows high freedom and responsibility for people
	Organisation consists of competent people
6. Paternalistic	Leader acts as a "father figure"
	Leader believes in the need to support people
	Leader makes decision but may consult
7. Bureaucratic	Leader focuses on rules to define the organisation
	Leader focuses on hierarchy
8. Charismatics	Leader creates energy and eagerness in people
	Leader is well liked and inspires people
	Leader appeals to people's emotional side
9. Autocratic	Leader has the power to make decisions alone, having total authority
	Leader closely supervises and controls people

There is no such principle of "one size fits all" in selecting the best leadership style since each has different impacts on different segments of an organisation's goal, including performance improvement. Unfortunately, there are some leadership styles which are not suitable for improving the performance of an organisation, hence the need to combine according to the context suitability within the organisation.

Government organisation performance is critical to be at the forefront as it needs to be ready and prepared with sufficient knowledge and emerging skills as well as being committed and flexible to serve the people, where an appropriate leadership style is seen as among the main drivers towards a better and more positive working attitude in government servants. Generally, government organisations are defined as public service organisations operating in a complex external and internal environment, where vital assumptions tend to change due to dynamic developments in society.

However, in Malaysia, public complaints received in January and September 2016 on unsatisfactory quality of

service from government organisations are significant at 15.9% and 13.0% respectively and trends show a decrease in last five years. This apparently leads to increased quality demand pressures by taxpayers and the government itself, so it is important for Malaysian government organisations to look for ways to create higher quality organisations and to achieve sustainable high performance. High Performance Organisation (HPO) principles may provide the answer here as the HPO framework has been empirically validated in three Asian countries – Nepal, Vietnam and the Philippines. Research into the application of the HPO framework has also shown that organisations can expect considerably better financial and non-financial results.

HPO is defined as an organisation that achieves financial and non-financial results that are exceedingly better than those of its peer group over a period of time of five years or more. This can be done by focusing in a disciplined way on that which really matters to the organisation, based on the five HPO characteristics (Figure 1), namely management quality, openness and action orientation, long-term orientation, continuous improvement and renewal as well as employee quality.

Figure 1: High Performing Organisation (HPO) framework

This article is aimed at appraising leadership styles towards improving performance by identifying the government servants' perception on current leadership styles in the Malaysian government organisation and examining the current performance of the Malaysian government organisation based on the HPO framework. It is expected that this article will provide valuable insights into the current performance of the Malaysian government organisation and suggest ways to improve performance based on the available principles of leaderships in the literature.

METHODOLOGY

One hundred government servants from two government organisations were involved in the questionnaire survey. The organisations were leading asset management, project management and engineering excellence for the nation and would deliver the country's public infrastructure. They were chosen as they had been given an important mandate by the government to become the agents of change in national development instead of being merely technical government organisations.

The questionnaire had gone through a pilot study on 15 government servants. It was divided into four sections. Section A was to obtain demographic data of respondents. Section B was to achieve objective 1, i.e. identifying the government servants' perception on current leadership styles in the government by randomly listing down the characteristics of each leadership styles as shown in Table 1. Section C was to achieve objective 2, i.e. examining the current performance of the Malaysian government organisation based on HPO characteristics randomly listed in Table 2.

RESULTS AND DISCUSSION

Out of the 100 questionnaires sent, 92 were returned with 87 valid responses. The majority of respondents were male, 51 years old and above, Bachelor degree holders, had over 20 years' working experience and were from top management levels such as head of division/deputy head of division and director/deputy director (see Figure 2).

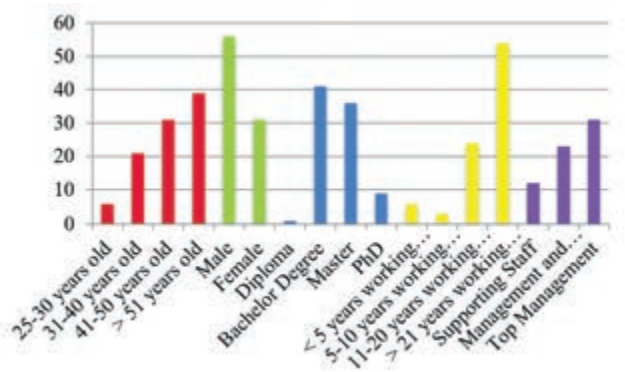

Figure 2: Demographic data of respondents

The leadership style was ranked based on the importance index (see Table 2), which showed that government servants perceived transactional leadership as the most practised by leaders in the Malaysian government organisation, followed by laissez-faire, transformational, servant and democratic.

On the other hand, the least practised was autocratic leadership, which showed a good sign of improvement in terms of positively impacting the overall performance of the government organisation.

Table 2: Perception on current leadership styles practised in Malaysian government organisation

Leadership Style	RII	Rank
Transactional	79.54	1
Laissez-Faire	78.62	2
Transformational	76.78	3
Servant	76.55	4
Democratic	76.03	5
Paternalistic	74.79	6
Bureaucratic	74.02	7
Charismatics	73.26	8
Autocratic	70.34	9

Table 3 showed that based on the HPO characteristics, the respondents claimed that the most obvious characteristic demonstrated by the leaders was employee quality, followed by long-term orientation, continuous improvement and renewal, management quality and finally openness and action orientation. The means recorded above 3.00 were considered high, which showed that the performance of the Malaysian government organisation resembling the HPO was acceptable. Yet more improvements were needed especially for the characteristics that recorded means lower than 3.20, namely leaders allow making mistakes, leaders are very effective, leaders welcome change and leaders always hold employees responsible for their results.

Table 3: Current performance of Malaysian government organisation based on High Performance Organisation (HPO) characteristics

No.	Management Quality	Mean
1	Leaders trusted by organisational members	3.90
2	Leaders have integrity	3.90
3	Leaders are a role model for organisational members	3.94
4	Leaders apply fast decision making	3.67
5	Leaders apply fast action taking	3.57
6	Leaders coach organisational members to achieve better results	3.71
7	Leaders focus on achieving results	4.05
8	Leaders are very effective	3.07
9	Leaders apply strong leadership	3.90
10	Leaders are confident	3.32
11	Leaders always hold organisational members responsible for their results	3.17
12	Leaders are decisive with regard to non-performers	3.31
No.	Average Mean	3.54
	Openness and Action Orientation	Mean
13	Leaders frequently engage in dialogue with organisational members	3.57
14	Organisational members spend much time on dialogue, knowledge exchange and learning	3.46
15	Organisational members are always involved in important processes	3.55
16	Leaders allow making mistakes	2.63
17	Leaders welcome change	3.13
18	The government organisation is performance driven	3.55
No.	Average Mean	3.31
	Long-Term Orientation	Mean
19	The government organisation maintains good and long-term relationships with all stakeholders	3.77
20	The government organisation is aimed at servicing customers as best as possible	3.77
21	Leaders have been with the government organisation for a long time	3.49
22	New leaders are promoted from within the government organisation	3.36
23	The government organisation is a secure workplace for organisational members	3.45
No.	Average Mean	3.57
	Continuous Improvement and Renewal	Mean
24	The organisation has adopted a strategy that sets it clearly apart from other organisations	3.31
25	Processes are continuously improved	3.40
26	Processes are continuously simplified	3.49
27	Processes are continuously aligned	3.59
28	Everything that matters to performance is explicitly reported	3.49
29	Relevant financial and non-financial information is reported to all organisational members	3.68
30	The government organisation continuously innovates its core competencies	3.37
31	The government organisation continuously innovates its products, processes and services	3.40
No.	Average Mean	3.54
	Employee Quality	Mean
32	Leaders inspire organisational members to accomplish extraordinary results	3.68
33	The resilience and flexibility of organisational members is continuously strengthened	3.77
34	The government organisation has a diverse and complementary workforce	3.68
35	The government organisation grows through partnerships with suppliers and/or customers	3.72
	Average Mean	3.71
	Overall Average Mean	3.52

CONCLUSION AND RECOMMENDATION

The Malaysian government currently practises transactional leadership style by focusing on management, procedures and efficiency, rules and contracts as well as current issues and problems. However, based on the HPO characteristics, its performance is acceptable but more improvements are needed, specifically the promoting of creative thinking via acceptance and by being failure-tolerant, leaders can help government servants overcome their fear of failure and so create a culture of intelligent risk taking that leads to sustained performance. ■

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Yasotha Chetty

SUSPENSION BRIDGE, SUNGAI TEMPASUK, KOTA BELUT, SABAH

Timber suspension bridges are a common sight in the rural settings of Sabah, enabling local villagers to cross often wide and treacherous rivers of the state. These bridges sometimes are the only mean of connection to the other side of a river, making them key rural infrastructures. As such, in the recent years, there has been a rise in awareness and call to maintain these bridges. Photo taken during a boat ride along Sungai Tempasuk. ■

SAFE TEA TIME

TO RECORD OR NOT TO RECORD

by Ir. Shum Keng Yan

***Ir. Shum Keng Yan** is a chemical engineer and a certified accident prevention and safety practitioner.*

That is the question on observation cards and checklists...

We have looked at the functions of checklists and cards. We have also explored the SDCA/PDCA cycle to understand how we are doing in sustenance.

We also need to ask ourselves the purpose of keeping records in the first place. Are we recording to evidence performance? Are we recording to ensure governance of the process? Are we recording because that is the only way we know?

What are our options? Can we remove (some) recordings? Let's look at 3 options.

1. **Evidencing Performance:** If we record to evidence performance, perhaps we can consider measuring the final output. For example, records of the substandard and unsafe often require an action tracker which is logged somewhere. Rather than creating an intermediate record, is the action tracker sufficient?
2. **Governing Processes:** If the records are just to keep track that something has been "done", it can be an easy tick-the-box exercise once we know the ropes. I remember a case where the supervisor explained that they needed the checklist because this way, they will know who did the job if it's ticked and signed. I told him I was happy to tick and sign there and then but the job might still not be done. It is just a piece of paper that shows someone has claimed to have done the job. Perhaps we can govern by having actual face-to-face coaching or a walk at the site. Allocating quality time to "be there" is so much better than receiving a document with all the right ticks.
3. **Other ways to measure:** Pulse Surveys or Focus Groups outputs are often more proactive measures compared to behavioural observation. Perhaps getting direct feedback early on can tell us more than collecting cards and records to be analysed reactively. Toolbox gathering is another great way to get the information and to agree on action without the need to fill any intermediate record.

If we make the process simpler, we should be able to get better buy-in and deliver better implementation. Try to challenge the need for intermediate recording. Look for other existing avenues for evidence in the system. Challenge the need for a checklist to ensure the other checklist is checked to check that the system is checked.

If you need me to tick your box, just email me at: *pub@iem.org.my.* ■

"It is ticked, therefore, it is done!" an old hand

FORUM

A VISIT TO THE PARLIAMENT OF MALAYSIA

PROJECT MANAGEMENT TECHNICAL DIVISION

reported by

Ir. Assoc. Prof. Dr Syuhaida Ismail

On 20 February 2019, the Project Management Technical Division (PMTD) of IEM organised a technical visit to the restoration and upgrading works of The Parliament Building of Malaysia (Phase 2B). PMTD was privileged to be the last visitors to the 56-year-old Parliament Building.

A delegation of 25 IEM members arrived at the main entrance of Parliament Building at 10 a.m. and a Public Works Department (PWD) representative brought us to the PWD site office where we were warmly welcomed and briefed on the Phase 2B project by the resident engineer.

Phase 2B focused on structural repair works, upgrading of the Dewan Rakyat (House of Representatives) and the Dewan Negara (Senate), upgrading the infrastructure and equipment for mechanical systems, electrical and information technology systems as well as other works involved.

Although Phase 2B involved the restoration and upgrading of the inside of the main block, Parliament Square and the surrounding areas, our visit was restricted to the main block.

After a short networking session over breakfast, a representative of Corporate Relation Unit of the Parliament of Malaysia guided us to the Dewan Rakyat and the Dewan Negara. We saw 2 suspended staircases that were of classic design.

Next, we visited The Parliament Gallery which houses the maces (cokmar), the royal regalia symbolising the royal authority of the Government. We were also shown The Royal Stairs (or Once a Year Stairs) which is used exclusively by the Yang di-Pertuan Agong and his Consort when they come to the Dewan Rakyat to officially open a new session of Parliament.

Before the visit ended at 1 p.m., we were brought to the Tunku Abdul Rahman statue near Parliament Square for a group photo session. The delegation enjoyed the technical visit to Parliament House, which was gazetted as a National Heritage Building under the National Heritage Act 2005, as it allowed them to see for themselves the restoration and upgrading works of heritage buildings as established by the National Heritage Department. ■

PMTD committee members pose at the main entrance of the Dewan Rakyat

Briefing session on Phase 2 restoration and upgrading works of the Parliament Building

Posing with Tunku Abdul Rahman's statue

IEM GIVES BACK – ROHINGYA CHILDREN

PROJECT MANAGEMENT TECHNICAL DIVISION

reported by

Dr Teow Yeit Haan

The plight of the Rohingya is said to be the world's fastest growing refugee crisis. Since August 2017, nearly 700,000 have fled their homes and persecution in the northern Rakhine province of Myanmar for neighbouring Bangladesh.

IEM's Project Management Technical Division (PMTD) made a donation to support children studying at School Al-Ikhlas & Rohingya Refugees Centre during a fund raising programme at Universiti Kebangsaan Malaysia.

The mock cheque hand-over ceremony was held at Dewan Canselor Tun Abdul Razak on 28 June 2019. The PMTD believed that education was essential to achieve the overall goal of breaking the cycle of poverty and for a better future.

PMTD chairman Vincent Wong Khien Ngee (far left) presenting the donation to School Al-Ikhlas & Rohingya Refugees Centre. With him are (from left) Tan Sri Abdul Wahid Omar, chairman of Universiti Kebangsaan Malaysia, Prof. Ir. Dr Mohd Hamdi Abd Shukor, vice-chancellor of UKM and Tuan Haji Zainudin Mohd Daud, deputy director of administration

Established in August 2015, School Al-Ikhlas & Rohingya Refugees Centre is a pre-school and primary level learning centre for Rohingya children registered with the United Nations High Commission for Refugees or UNHCR. It is located in Selayang, Wilayah Persekutuan, and the children are mainly from Rohingya Muslim families.

There are about 100 children in the school. Apart from providing them with basic education, the school also helps the children adjust to life and their new surroundings. It also serves as a centre for helping the underprivileged in the neighbourhood such as a monthly food distribution.

Children of School Al-Ikhlas & Rohingya Refugees Centre on stage to receive the gift

It is a one-stop centre for Rohingya refugees in the Klang Valley.

However, funding is a challenge. Without regular sponsorship and support, the school is at risk, so it is hoped that the charity programme will be on-going. ■

Upcoming Activities OCTOBER 2019

1-Day Course on "Energy Storage-Based Devices: Technology and Opportunities with Renewable Generation, T&D and Microgrids"

Date	:	22 October 2019 (Tuesday)
Time	:	9.00 a.m. to 5.30 p.m.
Venue	:	Wisma IEM
Approved CPD	:	7
Speaker	:	Mr. Aki Leinonen

1-Day Course On "A Quick Guide to BEM Professional Competency Examination for Air Conditioning and Mechanical Ventilation System"

Date	:	24 October 2019 (Thursday)
Time	:	9.00 a.m. to 5.30 p.m.
Venue	:	Wisma IEM
Approved CPD	:	6.5
Speaker	:	Ir. Ng Yong Kong

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FORUM

INSPIREME TALK: OPPORTUNITIES & CHALLENGES IN SEMICONDUCTOR INDUSTRY

ELECTRONIC ENGINEERING TECHNICAL DIVISION

reported by

Ir. Dr Lee Choo Yong

Dr Yeap Gik Hong

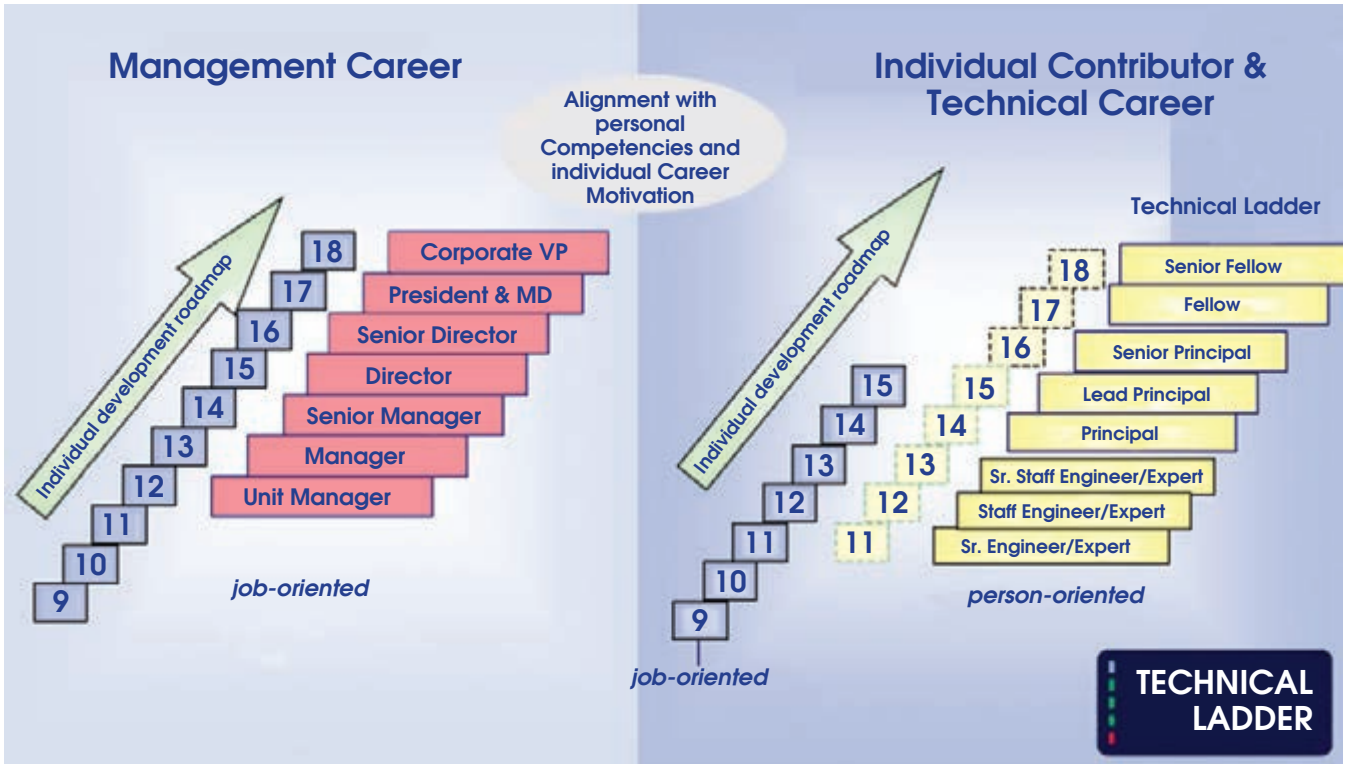
On 2 May 2019, the Electronic Engineering Technical Division (eETD) organised an InspireMe Talk titled Opportunities & Challenges in Malaysia Semiconductor Industry.

The talk by Dr Lee Cheong Chee (a.k.a. CC Lee) at KDU Penang University College, was attended by 32 IEM members and engineering students.

Dr Lee, a prominent technical leader in the semiconductor industry, started the talk by sharing about his career journey, from a test & product engineer in National Semiconductor to General Manager of NXP Semiconductor and finally, as President/Managing Director of Infineon Technologies. He retired recently.

He also talked about his experiences working with different corporate cultures such as American companies and a German company. He then elaborated on the history of the global semiconductor market, highlighting the world's biggest semiconductor producers in the past few years and the presence of semiconductor industry players in the country. He said the key advantages of semiconductor manufacturing in Malaysia were:

- Relatively low cost of labour
- Government support
- Established ecosystem for semiconductor backend manufacturing
- Free from natural disasters



Example of a career path in the semiconductor industry

Group photo after the talk

Dr Lee elaborated on opportunities and challenges in the industry. He said the semiconductor market will continue to grow as these devices are the enabler of emerging technologies such as sophisticated smartphones and tablets, compact memory drives, 5G communication, electric vehicles, autonomous driving etc., all of which help make our lives more efficient, faster and interesting.

This market growth has attracted plenty of competition but only companies which stay innovative and agile can survive and excel. Continuous cost and quality improvement as well as innovation are a must in the market and all these require engineering talents, so there are huge job opportunities in this industry. He said high demand jobs in the semiconductor industry are:

- Process & quality engineers
- Product & test engineers
- Products designers (innovative & creative jobs)
- Computer programmer & software developer
- Maintenance & equipment engineers
- Automation & industrial engineers
- Specialised technical sales engineers
- Failure analysis and reliability engineers.

He talked about career paths in the industry; i.e. management path and technical ladder for individuals. At the end of the talk, Dr Lee shared some of his own experiences and offered the following advice:

- Be passionate in what you do
- Never give up
- Be open minded
- Make the best of your life
- Show effort
- Learn from your own experience and mistake
- Be consistent
- Dedicate your life to something meaningful/great
- Find something that you really enjoy
- There's a lot more to be learnt after university
- People with the right attitudes will rise up
- Always ask questions; never be embarrassed to do so

He emphasised that attitude was an essential attribute in successful people. The talk was insightful, inspiring and informative and the Q&A session, lively. It ended with the presentation of a token of appreciation and a group photograph. ■

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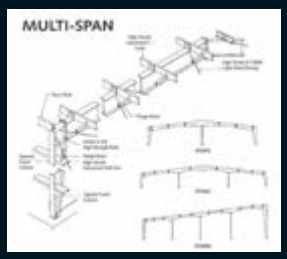

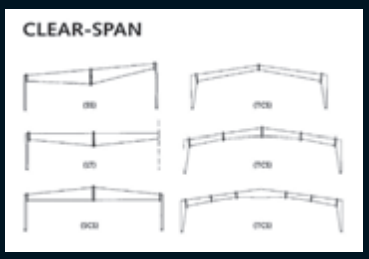

		BUILDING WIDTH	SIDEWALL HEIGHT
	Multi-Span		
(TCM1)	Tapered Column Modular One Interior Column	18m - 100m	3.5m - 12m and over
(TCM2)	Tapered Column Modular Two Interior Column	28m - 120m	3.5m - 12m and over
(TCMSS)	Tapered Column Multi - Span Single Slope	20m - 160m	3.5m - 12m and over
	Clear-Span		
(SS)	Straight Column Single Slope	4.5m - 22m	3m - 9m
(LT)	Straight Column Lean To	3m - 22m	2.4m - 9m
(SCS)	Straight Column Clear Span	6m - 22m	3m - 9m
(TCS)	Tapered Column Clear Span	6m - 30m	3.5m - 12m and over
(TCS)	Tapered Column Clear Span - Two Piece Rafter	12m - 85m	3.5m - 12m and over
(TCS)	Tapered Column Clear Span - Three Piece Rafter	12m - 85m	3.5m - 12m and over

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26TH AGM OF IEM, NEGERI SEMBILAN

NEGERI SEMBILAN BRANCH

Ir. Dr Oh Seong Por

Group photo

On 24 August 2019, IEM, Negeri Sembilan Branch (IEMNS) held its 26th Annual General Meeting at the IEM office in Oakland Commercial Square, Seremban. The event was graced by the presence of IEM President Ir. David Lai Kong Phooi and Ms Janet Lim, COO of IEM. Also present were 53 members, comprising 4 fellows, 48 corporate members and 1 graduate member. The AGM started at 10 a.m. and ended at 12.15 p.m.

Prior to the AGM, Ir. Chee Shai Choon gave a talk on the Essentials of Earthworks Design; he had written a book on the topic.

In his opening address, IEMNS Chairman Ir. Dr Oh Seong Por welcomed those present and thanked the President for gracing the event. Then, with the help of computer slides, he talked about the activities carried out by IEMNS from July 2018 to August 2019. These were in line with IEM's objectives to support fellow engineers, engage in nation building and promote the engineering profession to the community.

There were 5 technical visits, to Kibing Glass Plant, Kualiti Alam Processing Plant, Regional Sewage Treatment Plant, Stanley Engineered Fastening Factory and klia2. The 3 PI seminars and 2 dialogues with graduate members were organised to help candidates acquire professional engineer competency status.

1. Chairman Ir. Dr Oh (right) presenting a token of appreciation to Ir. David Teh
2. From left: IEM President Ir. David Lai, Ir. Chee Shai Choon and IEMNS Chairman Ir. Dr Oh Seong Por

An informative talk on the Construction Industry Payment and Adjudication Act 2012 (CIPAA) by prominent lawyer Yang Tek Yeh, was held to enlighten members about this act.

Ir. Dr Oh also delivered a technical talk on the momentum gathering topic, sustainable product design. In conjunction with the Chinese New Year festivities, an open house celebration was organised in February.

There were 3 combined activities with Manipal International University, Universiti Sains Islam Malaysia and Nilai University. In addition, IEMNS collaborated with STEM committee's Mr. Chua Yaw Loon to promote

science, technology, engineering and mathematics to school pupils in Seremban.

A biennial dinner for 400 guests was held on 29 June and was graced by the presence of Menteri Besar YAB Dato' Seri Hj. Aminuddin bin Harun. The event was reported in the local media such as The Star, Nanyang Siang Pau and Bernama website. Ir. Dr Oh noted that in a period of 14 months, there were reports on 7 major IEMNS activities in the branch news column of *JURUTERA*.

President Ir. David Lai congratulated IEMNS for its numerous activities which not only benefitted members and partners but also brought new developments to the branch. According to him, IEM now has, to date, 52,000 members, comprising corporate, graduate and student members. It is well respected not only within the country but also in the international arena. However, he added, rapid global change required members to be more proactive, agile and, most importantly, practise constructive dialogue. The unity and close cooperation among fellow members are the strengths that will ensure IEM remains relevant.

Ir. Chong Chee Yen, the honorary treasurer, presented the financial statement which had been scrutinised earlier by internal auditors Dato' Ir. Chan Peng Chee and Ir. Tan Seong Lim and certified by the external auditor, Chartered Accountant RW William.

Ir. Tiong Ngo Pu, the election officer, announced the election results for the new committee members for session 2019/2020 (see Table 1).

In his closing address, Ir. Dr Oh welcomed the new committee and expressed hope that it would deliver more in the coming months, with more activities planned for members.

He then thanked and presented tokens of appreciation to the past committee members. He thanked fellow engineers and partners for their generous support for the biennial dinner.

As is his usual practice, he ended his speech with a Malay pantun and the audience responded with a big applause. A group photo session with the President was also arranged. ■

Negeri Sembilan negeri kita
IEM Negeri persatuan kita
Sokongan ahli kekuatan kita
Demi persatuan untuk kita

Table 1: IEMNS Committee 2019 / 2020

Executive Committee, IEM Negeri Sembilan Branch Session 2019/2020	
Chairman	Ir. Dr Oh Seong Por
Vice Chairman I	Ir. Arthira
Vice Chairman II	Ir. Kanna Dasan Narayanasamy *
Honorary Secretary	Ir. Hazlin bin Harun
Honorary Treasurer	Ir. Chong Chee Yen
Committee Members	Ir. Richard Khoo Nee Kheong
	Ir. Dr Noorazizi bin Mohd
	Ir. Mohd Firdaus bin Zainal
	Ir. Azizi bin Ahamad
	Y.Bhg. Dato' Ir. Zainurin bin Karman
Immediate Past Chairman	Ir. Tiong Ngo Pu
Past Chairman (reinvited)	Ir. Shahrin Amri bin Jahari

** appointed to the position by the committee according to the guidelines of the branch operation manual.*

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

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

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

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

Constructions of:

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- ☐ Foundations/tunnels
- ☐ Pipelines/refineries
- ☐ Structures/steel work
- ☐ Building (commercial, industrial)
- ☐ Housing
- ☐ Construction management
- ☐ Deep mining

Manufacturer of:

- ☐ Construction equipment
- ☐ Cement
- ☐ Other construction materials
- ☐ Distribution
- ☐ Construction equipment
- ☐ Construction materials
- ☐ Hire/rental of construction equipment
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Updated May 2018

EL ATENEO, THE MOST BEAUTIFUL BOOKSTORE IN THE WORLD

Ir. Chin Mee Poon

***Ir. Chin Mee Poon** is a retired civil engineer who derives a great deal of joy and satisfaction from travelling to different parts of the globe, capturing fascinating insights of the places and people he encounters and sharing his experiences with others through his photographs and writing.*

The Most Beautiful Bookstore in the World

Imagine a theatre with a total floor area of 2000 sq. m. that showcases not stage performances but rows and rows of books. This is El Ateneo Grand Splendid, the most beautiful bookstore in the world.

When my wife and I, together with my two younger brothers and their spouses, dropped in to pay homage to this temple of knowledge in early April 2019, the charming building was almost exactly 100 years old. Situated in busy Santa Fe Avenue in Barrio Norte, Buenos Aires, the capital of Argentina, the building has a façade that truly stands out from its neighbours. Known as Teatro Gran Splendid, it was opened in May 1919 with a seating capacity of 1,050 and offered stage performances of different genres, including tango dances. Later the theatre was turned into a cinema and the earliest sound movies in the country were shown there.

A bookseller-cum-publisher leased the building in early 2000 and converted it into a one-of-its-kind bookshop. Many of the original theatre features remain, including the exquisite ceiling painting, the ornate carving decorations on the galleries, balconies and boxes, the stage itself, the crimson stage curtain and the auditorium lighting.

The stage has become a little cosy café where one can rest tired legs and enjoy a steaming cuppa with a slice of creamy cake after browsing through rows and rows of books in the main auditorium. A pair of escalators slides through an oval opening from the main floor to the basement which houses the junior section. More books and music compact discs and DVDs are displayed on the two levels of balconies and what used to be the lobbies and refreshment areas on the various floors.

In a good year, it has over a million visitors, either customers or curious admirers, and as many as 700,000 books are sold. Unfortunately this beautiful bookstore sells almost exclusively Spanish books. Only a single bookshelf of English titles is available at the entrance area.

The name of the bookstore, El Ateneo, is the Spanish version of The Athenaeum which was a school founded by the Roman Emperor Hadrian in Rome to promote literary and scientific studies. The name was derived from the Greek city of Athens which was then regarded as the seat of intellectual refinement. Today the term is loosely used to refer to an institution, such as a literary club or scientific academy, for the promotion of learning. It may even refer to a library, a reading room or such similar place.

I love books and bookshops never fail to catch my attention. Bookshops with characters, or attitude as some people may prefer, always attract me during my travels. To me, such bookshops are not just places to go and buy a book or two but are tourist attractions in their own right.

In April 2016, my wife and I were lucky to come across a bookstore housed in a church building in Maastricht near the south-east corner of The Netherlands. First built at the end of the 13th century, the Dominican church was abandoned at the end of the 18th century and became livestock pans, bicycle stores, exhibition centre and party hall at different times until it finally housed a unique bookstore in 2006. During my visit, the bookstore appeared to be well patronised. The original church structure was mostly been retained and the choir had been turned into a little café. Books sold were in five languages: English, French, Spanish, German and Italian. I derived so much pleasure delving into the volumes and volumes of books. ■

Tarikh: 17 September 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
(Sessi 2019/2020)

PERMOHONAN BARU

Nama	Kelayakan
KEJURUTERAAN ELEKTRIKAL	
TAN CHEE WAY	BE HONS (UNITEN) (ELECTRICAL POWER, 2008)
KEJURUTERAAN ELEKTRONIK	
ANUAR BIN JAAFAR	BE HONS (USM) (ELECTRONICS - COMPUTER, 2009) MSc (USM) (ELECTRONIC SYSTEMS DESIGN ENGINEERING, 2011)

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KEJURUTERAAN MEKATRONIK	
MOHAMED ZAFRAN BIN HAJA MOHIDEEN	BE HONS (IIUM) (MECHATRONICS, 2005) M Tech (CURTIN) (PETROLEUM TECHNOLOGY, 2011)

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70532	WONG JIAN MING	BE HONS (UTAR) (CIVIL, 2014)
19369	ZAHIRANIZA BINTI MUSTAFFA	BE HONS (UTM) (CIVIL, 2000) MSc (ALBERTA) (WATER RESOURCES, 2003) PhD (DELFT) (2011)
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56394	MOHD SOLEHUDDIN BIN MAHMUD	BE (UMP) (ELECTRICAL - POWER SYSTEM, 2013)
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70485	CHUA EU LIANG	BE HONS (UTAR) (MECHANICAL, 2013)
48558	WAN MUHAMMAD DJAWAD BIN WAN DZAHANURIN	BE HONS (UNITEN) (MECHANICAL, 2012) MSc (THE UNIVERSITY OF SHEFFIELD) (STEEL CONSTRUCTION, 2014)
70267	ZULFAKAR BIN ISMAIL	BE HONS (UiTM) (MECHANICAL, 2009)
KEJURUTERAAN SUMBER AIR		
59069	IZNI BINTI MOHD ZAHIDI*	BE HONS (UPM) (CIVIL, 2008) JOINT EUROPEAN MSc (NICE SOPHIA ANTIPOLIS, NEWCASTLE, BUDAPEST) (HYDRO-INFORMATICS & WATER MANAGEMENT - EUROAQUAE, 2011) PhD (UPM) (2017)

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45842	MOHD SHAH RIZAL BIN SAMSUDIN	BE HONS (UTM) (ELECTRICAL-ELECTRONICS, 2009) MSc (UTP) (ELECTRONICS SYSTEM, 2015)
KEJURUTERAAN MEKANIKAL		
33782	HUA SHIJIE, NORMAN	BE HONS (USM) (MECHANICAL, 2005) MSc (MALAYA) (2017)
24328	YAP TZE CHUAN	BE HONS (UTM) (MECHANICAL, 2000)

Pengumuman yang ke-132

SENARAI PENDERMA KEPADA WISMA DANA BANGUNAN IEM

Institusi mengucapkan terima kasih kepada semua yang telah memberikan sumbangan kepada tabung Bangunan Wisma IEM. Ahli-ahli IEM dan pembaca yang ingin memberikan sumbangan boleh berbuat demikian dengan memuat turun borang di laman web IEM http://www.iem.org.my atau menghubungi secretariat di +603-7968 4001 / 5518 untuk maklumat lanjut. Senarai penyumbang untuk bulan Ogos 2019 adalah seperti jadual di bawah:

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3	99272	SDRI TAN LYN MENG
4	72454	MR. RAMLAN BIN OMAR
5	31522	MR. HEANG CHEE TONG
6	43723	IR. DR CHAN SEONG PHUN
7	15793	MR. CHANG CHEE CHEONG
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9	28551	MR. KAMAL ASHRAFF BIN MOHAMAD ASHRAY
10	21570	IR. DR GOVINDARAJAN S/O VEERAPPAN
11	79001	MR. MOHD IKHWAN BIN AHMAD NAWAWI
12	38741	MR. UNANG ANAK BUNDAN

UPCOMING ANNUAL GENERAL MEETINGS – TECHNICAL DIVISION

DATE	TECHNICAL DIVISION	CPD
19 October	Mechanical Engineering Technical Division	2
02 November	Highway & Transportation Engineering Technical Division	2
16 November	Agricultural & Food Engineering Technical Division	2
07 December	Urban Engineering Development Special Interest Group	2
14 December	Oil, Gas and Mining Technical Division	2

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KEAHLIAN

PEMINDAHAN KEPADA AHLI 'COMPANION'

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33715	NOR HASNIZA BINTI MAT ISA	B.E.HONS.(UNISEL)(CIVIL, 2006)
28334	NOR HAFIZAH BINTI ABDUL RAHIM	B.E.HONS.(UTM)(CIVIL, 2008)
KEJURUTERAAN PERTANIAN		
79024	DR SANG YEW NGIN	B.E.HONS.(UPM)(AGRICULTURAL, 1997)M.E.(UPM)(ENVIRONMENT, 1998) PhD.(UNITEN)(BUSINESS MANAGEMENT, 2017)

PERMOHONAN KEPADA AHLI 'COMPANION'

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102975	MOHD KASYFI AHMAD FAUZI	B.E.HONS.(MALAYA)(CIVIL, 2007)
102226	TASYRIFF IZZAT BIN ZAINAL ABIDIN	B.E.HONS.(UiTM)(CIVIL, 2007)
102976	MUHAMMAD NIZAR BIN SADDUM	B.E.HONS.(USM)(CIVIL, 2006) M.Sc.(USM)(CIVIL, 2015)
102972	HEW CHOON SHENG	B.E.HONS.(UTM)(CIVIL, 2000)
102969	NOR AZNIZA BINTI ISHAK	B.E.HONS.(UTM)(CIVIL, 2000)
102970	ROSZAIDI BIN ROSLAN	B.E.HONS.(UTM)(CIVIL, 2004)
KEJURUTERAAN BIO PERUBATAN		
101964	GOBI KRISHNAN	B.E.HONS.(UNIVERSITY OF DUNDEE)(ELECTRONIC & ELECTRICAL, 2005) M.Sc. (UNIVERSITY OF DUNDEE)(DESIGN FOR MEDICAL TECHNOLOGIES, 2009)
KEJURUTERAAN ELEKTRIKAL		
102974	LING SING YII	B.E.HONS.(THE UNI. OF ADELAIDE)(ELECTRICAL & ELECTRONICS, 2004)
102973	MUHAMMAD FARID BIN HASNI	B.E.HONS.(UNITEN)(ELECTRICAL POWER, 2009)
102252	SUBASHINI A/P JAYABALAN	B.E.HONS.(UTM)(ELECTRICAL, 2010) M.E.M.(UPM)(MANAGEMENT, 2014)
KEJURUTERAAN ELEKTRONIK		
102251	AHMAD NORHISHAM WAHONO	B.E.HONS.(UTM)(ELECTRICAL-ELECTRONIC, 2002)
101965	NIZAR BIN AHMAD	B.E.HONS.(UTM)(ELECTRICAL-TELECOMMUNICATION, 2005)
KEJURUTERAAN MEKANIKAL		
102225	ROHAIDEE BIN OMAR	B.E.(NAGAOKA UNI. OF TECH)(MECHANICAL, 2005)
102971	MOHD HELMI BIN MAHAT	B.E.HONS.(IIUM)(MECHANICAL, 2008)
102229	SIA TING FONG	B.E.HONS.(MONASH UNI.)(MECHANICAL, 2002)
102228	MOHD SYURGAWI BIN HAJAR	B.E.HONS.(UiTM)(MECHANICAL, 2007)
101966	NGAN YEEP HIAM	B.E.HONS.(UNITEN)(MECHANICAL, 2009)
102977	IBRAHIM BIN ALI	B.E.HONS.(UTM)(MECHANICAL, 1994)
KEJURUTERAAN PENGELUARAN		
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PERMINDAHAN KEPADA AHLI SISWAZAH

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85460	CHIA KEN LIN	B.E.HONS.(UTAR)(ENVIRONMENTAL, 2016)
KEJURUTERAAN AWAM		
81387	CHAW HUI WEN	B.E.HONS.(IUKL)(CIVIL, 2017)
81246	WONG SIEW MING	B.E.HONS.(IUKL)(CIVIL, 2017)
81390	NOR SURAYA BINTI ABDULLAH	B.E.HONS.(IUKL)(CIVIL, 2017)
66315	YOO SWEE HOONG	B.E.HONS.(IUKL)(CIVIL, 2017)
26620	MUHAMMAD YAZID BIN OMAR	B.E.HONS.(MALAYA)(CIVIL, 2006)
51466	YANG CHING HIAN	B.E.HONS.(SWINBURNE UNI. OF TECH.)(CIVIL, 2015)
90317	GOH WEI ZER	B.E.HONS.(THE UNI. OF ADELAIDE)(CIVIL & STRUCTURAL, 2018)
68845	ADNIN RAZZAQI BIN AWALUDIN	B.E.HONS.(UiTM)(CIVIL, 2016)
76883	MUHAMMAD AMIR BIN KAMARUDIN	B.E.HONS.(UiTM)(CIVIL-INSFRASTRUCTURE, 2016)
72493	FAZIRAH NURHA BINTI MOHAMAD SAAD	B.E.HONS.(UKM)(CIVIL & STRUCTURAL, 2016) M.Sc. (UKM)(CIVIL, 2017)
81770	LOH RI JIAN	B.E.HONS.(UMP)(CIVIL, 2017)
81831	TAN WEI MONG	B.E.HONS.(UMP)(CIVIL, 2017)
78665	THARUSHINI A/P THIAGARAJAN	B.E.HONS.(UMP)(CIVIL, 2017)
78706	SOLAHUDDIN BIN AZUWA	B.E.HONS.(UMP)(CIVIL, 2017)
43322	LOOK KUAN CHUNG	B.E.HONS.(UMS)(CIVIL, 2012)
53044	KEEK JOE VERN	B.E.HONS.(UMS)(CIVIL, 2015)
52104	HAFIDZA AKMAL BINTI JUMAT	B.E.HONS.(UNIMAS)(CIVIL, 2012)
52132	SITI NAJJIYA BINTI MINGU	B.E.HONS.(UNIMAS)(CIVIL, 2016)
69736	ANDREANA ALLYSSA ANAK HENRY	B.E.HONS.(UNIMAS)(CIVIL, 2017)
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44784	LAI CHIN LEONG	B.E.HONS.(UTP)(CIVIL, 2011)
62069	KUEH CHING HAN	B.E.HONS.(UTP)(CIVIL, 2017)
62071	MOHAMAD HAIQAL B. AZHAR	B.E.HONS.(UTP)(CIVIL, 2017)
45951	ENG VIN SHERN	M.E.HONS.(THE UNI. OF NOTTINGHAM)(CIVIL, 2013)
KEJURUTERAAN ELEKTRIKAL		
74343	HIEW CHUN LIM	B.E.HONS.(A.P.U)(ELECTRICAL & ELECTRONIC, 2017)
74345	WONG CHUEN YAN	B.E.HONS.(A.P.U)(ELECTRICAL & ELECTRONIC, 2018)
47167	OOI BAN JUAN	B.E.HONS.(MALAYA)(ELECTRICAL, 2012)
71510	TAN WEI TING	B.E.HONS.(MALAYA)(ELECTRICAL, 2015)
73915	MOHAMAD ADIB BIN AHMAD FATHI	B.E.HONS.(MMU)(ELECTRICAL, 2018)
74578	TAN LIK WUI, IAN	B.E.HONS.(SWINBURNE UNI. OF TECH.)(ELECTRICAL & ELECTRONIC, 2016)
60540	MUHAMMAD NUR IHSAN B. CHE AZIZ	B.E.HONS.(UiTM)(ELECTRICAL, 2017)
81882	NOR HERMAN BIN AFANDI	B.E.HONS.(UiTM)(ELECTRICAL, 2017)
47017	HOW KEN LEE	B.E.HONS.(UNI. OF TASMANIA)(ELECTRICAL POWER, 2014)
47162	BONG CHONG WEI	B.E.HONS.(UniMAP)(ELECTRICAL SYSTEMS, 2011)
79683	HOO KAI WEI	B.E.HONS.(UNITEN)(ELECTRICAL & ELECTRONIC, 2018)
49188	TAY KIAN AIK	B.E.HONS.(UNITEN)(ELECTRICAL & ELECTRONICS, 2013)
64718	SHASHVINDAVE SINGH A/L PERAM SINGH	B.E.HONS.(UNITEN)(ELECTRICAL POWER, 2015)
87972	LOH ZHENG LUN	B.E.HONS.(USCI UNI.)(ELECTRICAL & ELECTRONICS, 2018)
87999	YAP KAH YUNG	B.E.HONS.(USCI UNI.)(ELECTRICAL & ELECTRONICS, 2018)
57752	FARAH ADIBAH BT. KAMARULZAMAN	B.E.HONS.(USM)(ELECTRICAL, 2016)
80362	CHIN KOK CHING	B.E.HONS.(UTAR)(ELECTRICAL & ELECTRONIC, 2018)
85277	NUR FASHIHA BINTI MOIN	B.E.HONS.(UTeM)(ELECTRICAL-CONTROL, INSTRUMENTATION & AUTOMATION, 2016)
34736	NUR AMANI BINTI NOR IDI	B.E.HONS.(UTeM)(ELECTRICAL-INDUSTRIAL POWER, 2010)
34698	HAPIZ BIN SHAHRIL	B.E.HONS.(UTeM)(ELECTRICAL-INDUSTRIAL POWER, 2010)
72860	LOW ZHENG KAI	B.E.HONS.(UTeM)(ELECTRICAL-INDUSTRIAL POWER, 2017)
63176	SHAFRI BIN SAAD	B.E.HONS.(UTeM)(ELECTRICAL-INDUSTRIAL POWER, 2017)
48716	MUHAMAD ASYRAF BIN SAID MOHD SOOD	B.E.HONS.(UTHM)(ELECTRICAL, 2012)
KEJURUTERAAN ELEKTRONIK		
46986	MOHD AZWAN BIN RAMLAN	B.E.HONS.(UMP)(ELECTRICAL-ELECTRONICS, 2012 M.E.(MALAYA)(INDUSTRIAL ELECTRONICS & CONTROL, 2016)
70105	WONG SOON YAW	B.E.HONS.(UTM)(ELECTRICAL-ELECTRONICS, 2017)
KEJURUTERAAN KIMIA		
86343	TAN SYEE JIA	B.E.HONS.(SEGi)(CHEMICAL, 2017)
87942	MAK KAI XIANG	B.E.HONS.(UCSI UNI.)(CHEMICAL, 2018)
22729	SUHAILA BINTI MOHD SAUID	B.E.HONS.(UiTM)(CHEMICAL, 2006)
31993	DR. MOHAMAD FIRDAUS BIN MOHAMAD YUSOP	B.E.HONS.(USM)(CHEMICAL, 2011) M.Sc.(USM)(CHEMICAL, 2013) PhD.(USM)(2018)
34803	NOOR HIDAYU BINTI ABDUL RANI	B.E.HONS.(UTM)(CHEMICAL, 2010) M.Sc.(UiTM)(CHEMICAL, 2015)
40098	NUR IKHRAM BIN ABU KASSIM	B.E.HONS.(UTM)(CHEMICAL-GAS, 2011)
80233	YUGADARSHNI A/P SAMUDRA RAJA	B.E.HONS.(UTP)(CHEMICAL, 2017)
45126	CHEAN PO YI	M.E.HONS.(THE UNI. OF NOTTINGHAM)(CHEMICAL with ENVIRONMENT, 2011)
KEJURUTERAAN MEKANIKAL		
80776	CHANG EN KAI, KELVIN	B.E.HONS.(CURTIN UNI.)(MECHANICAL, 2018)
38822	SALIKKA A/P LIM CHUNG SENG	B.E.HONS.(MALAYA)(MECHANICAL, 2011)
68500	YONG YOU WEI, GAVIN	B.E.HONS.(MONASH UNI.)(MECHANICAL, 2018)
87032	PREESHAATH RAOO A/L SUBRAMANY	B.E.HONS.(SEGi)(MECHANICAL, 2016)
65048	WONG SHIN CHIEN	B.E.HONS.(TAYLOR'S UNI.)(MECHANICAL, 2018)
39887	MUHAMMAD AZIZI BIN ABDUL MALEK	B.E.HONS.(UiTM)(MECHANICAL, 2012)
59734	WAN AMIRUL FADHLI B. WAN ABDUL MUNIR	B.E.HONS.(UiTM)(MECHANICAL, 2016)
53563	NURUDDIN BIN HAMZAH	B.E.HONS.(UiTM)(MECHANICAL, 2016)
67615	MUHAMMAD FAREEZ IZWAN B. ABDUL JALIL	B.E.HONS.(UiTM)(MECHANICAL, 2017)
75765	MUHAMMAD RIDZUAN BIN OTHMAN	B.E.HONS.(UiTM)(MECHANICAL, 2017)
88460	GURUBARAN A/L PANERSELVAN	B.E.HONS.(UniMAP)(MECHANICAL, 2015) M.Sc. (UniMAP)(MECHANICAL, 2017)
51961	AZZAD ASYRAF BIN VICTOR	B.E.HONS.(UNIMAS)(MECHANICAL & MANUFACTURING, 2015)
51897	ROLF WILLA ANAK PATRICK SANDIN	B.E.HONS.(UNIMAS)(MECHANICAL & MANUFACTURING, 2015)
51900	ALBAN BERTNA ANAK MURAT	B.E.HONS.(UNIMAS)(MECHANICAL & MANUFACTURING, 2015)
58555	LAI LIT CHENG	B.E.HONS.(UNIMAS)(MECHANICAL & MANUFACTURING, 2016)
69989	NUR SHARZAINA HANUM BT. SEKIUN	B.E.HONS.(UNIMAS)(MECHANICAL, 2017)
35583	CHEONG YUN KIM	B.E.HONS.(UNITEN)(MECHANICAL, 2010) M.Sc.(UNI. OF SOUTHERN CALIFORNIA)(2016)
66659	PUVANESWARAN A/L RAJADOORAI	B.E.HONS.(UNITEN)(MECHANICAL, 2017)
95757	MOHAMMAD HUZREE BIN HUZAIMI	B.E.HONS.(UNITEN)(MECHANICAL, 2018)
36670	ZOL HAZIZI BIN MAHAT	B.E.HONS.(UPM)(MECHANICAL, 2011)
67063	KOGULAN A/L LETCHUMANAN	B.E.HONS.(USM)(MECHANICAL, 2017)
55189	MUHAMAD KHAIRUL ILMAN BIN SARWANI	B.E.HONS.(UTHM)(MECHANICAL, 2015)

63517	AHMAD IMRAN B. KASIM	B.E.HONS.(UTHM) (MECHANICAL, 2017)
55272	SHAHRULNAZZERY BIN NORDIN	B.E.HONS.(UTHM) (MECHANICAL, 2017)
40646	DR YONG CHUNG EE, JONATHAN	B.E.HONS.(UTM)(MECHANICAL-MARINE TECHNOLOGY, 2012) PhD.(UTM)(MECHANICAL, 2017)
60705	HARRIVIN A/L VIJAYAKUMARAN	B.E.HONS.(UTP)(MECHANICAL, 2017)

KEJURUTERAAN MEKATRONIK

90187	SITI SHAFARIANA BT SHAPIE	B.E.HONS.(A.P.U.) (MECHATRONIC, 2017)

KEJURUTERAAN PEMBUATAN

53881	LOO ZI ZHEN	B.E.HONS.(UNI. OF MALAYA) (CAD & MANUFACTURING, 2014)

KEJURUTERAAN SUMBER MINERAL

45693	MACLIVE WILKINSON ANAK AGAM	B.E.HONS.(USM)(MINERAL RESOURCES, 2014)

PERMOHONAN MENJADI AHLI SISWAZAH

No. Ahli	Nama	Kelayakan

KEJURUTERAAN AERONAUTIKAL

101063	ZAMARA BIN MUSTAPHA	B.E.HONS.(UNI. OF LONDON) (AERONAUTICAL, 1989) M.Sc.(LELAND STANFORD JUNIOR UNI.)(1991)

KEJURUTERAAN ALAM SEKITAR

100676	TEO PING JIE	B.E.(WESTERN AUSTRALIA) (ENVIRONMENTAL, 2012)

KEJURUTERAAN ARKITEK

100659	CHAN CHUEN PING, EDMUND	B.Sc.(UNIVERSITY OF OKLAHOMA) (ARCHITECTURAL, 2012) M.Sc.(UNIVERSITY OF OKLAHOMA)(CIVIL, 2014)

KEJURUTERAAN AWAM

100899	LO VUI KIONG, ALAN	B.E.(QUT)(CIVIL, 2015)
101041	MUHAMMAD ASYRAF BIN ROSLI	B.E.(UNI. OF NEWCASTLE) (CIVIL, 2014)
100828	YAP JUNE YONG	B.E.HONS.(CURTIN UNI.)(CIVIL & CONSTRUCTION, 2017)
100673	WAI KHAI LOON	B.E.HONS.(CURTIN UNIVERSITY)(CIVIL & CONSTRUCTION, 2017)
100680	HO KAE LUEN	B.E.HONS.(INTI INT. UNI.) (CIVIL, 2017)
101027	TEO JUN KANG	B.E.HONS.(IUKL)(CIVIL, 2017)
101031	CHUA KIONG HING	B.E.HONS.(KLIUC)(CIVIL, 2010)
101054	SOON KIM HIOH	B.E.HONS.(KLIUC)(CIVIL, 2011)
101020	ASRIZAL BIN JASNI	B.E.HONS.(MALAYA)(CIVIL, 2008)
99526	SU YEE LOONG	B.E.HONS.(MALAYA)(CIVIL, 2012)
100682	NAZMIR BIN ZULBADLI	B.E.HONS.(MALAYA)(CIVIL, 2013)
100683	MUHAMMAD SYAMIL BIN DZULFIDA	B.E.HONS.(MALAYA)(CIVIL, 2014)
100716	OI SIOK ZHEN	B.E.HONS.(MALAYA)(CIVIL, 2017)
101035	CHEAH UI KEE	B.E.HONS.(RMIT)(CIVIL & INFRASTRUCTURE, 2013)
100896	WAN AMIR HISYAM WAN ZAKARIAH	B.E.HONS.(RMIT)(CIVIL & INFRASTRUCTURE, 2013) M.Sc.(ICL)(SOIL MECHANICS, 2016)
100798	LING DAOQI	B.E.HONS.(RMIT)(CIVIL, 2013)
101053	LIU SIE CHING, AMELIA	B.E.HONS.(SWINBURNE UNI. OF TECH.)(CIVIL, 2011)
100894	MELDA EPPAH ANAK MESA	B.E.HONS.(SWINBURNE UNI. OF TECH.)(CIVIL, 2017)
100805	CHIN YIT YUNG	B.E.HONS.(SWINBURNE UNI. OF TECH.)(CIVIL, 2017)
100781	CHONG KET PING	B.E.HONS.(THE UNI. OF QUEENSLAND)(CIVIL, 2011)
100685	MOHAMAD RAZMI BIN A. RAHMAN	B.E.HONS.(UiTM)(CIVIL, 2009)
99519	AZRUL BIN ZULWALI KIFLI	B.E.HONS.(UiTM)(CIVIL, 2009) M.E.(UNIMAS)(CIVIL, 2012)
100797	NOOR AZIZAH BINTI KADAR BAWA	B.E.HONS.(UiTM)(CIVIL, 2011)
100809	FAZILA BINTI MD IDRIS	B.E.HONS.(UiTM)(CIVIL, 2012)
101023	ZGYMERRO NOER LITAK	B.E.HONS.(UiTM)(CIVIL, 2013)
100718	NUR ANISA ATHIRAH BINTI ROSLI	B.E.HONS.(UiTM)(CIVIL, 2017)
101038	NUR AZRIEN BINTI ABDUL AZIZ	B.E.HONS.(UiTM)(CIVIL-INFRASTRUCTURE, 2017)
101036	CHUAH RUN EN	B.E.HONS.(UKM)(CIVIL & ENVIRONMENTAL, 2015)
100882	MOHD NAZRI BIN NGAH	B.E.HONS.(UKM)(CIVIL & STRUCTURAL, 2006)
100878	AMALL RAIHAN BINTI ABDUL RAZAK	B.E.HONS.(UKM)(CIVIL & STRUCTURAL, 2008) M.E.(UTM)(CONSTRUCTION MANAGEMENT, 2018)
101017	LIM JIA JUN, OWEN	B.E.HONS.(UMP)(CIVIL, 2015)
101022	YAPP WEI TING, WESLEY	B.E.HONS.(UNI. OF BRISTOL)(CIVIL, 2014) M.E.(UNI. OF MELBOURNE) (STRUCTURAL, 2016)
101052	LIM WEE MING	B.E.HONS.(UNI. OF LEEDS)(CIVIL & ENVIRONMENTAL, 2016) M.Sc.(UNI. OF LEEDS) (ENVIRONMENTAL & PROJECT MANAGEMENT, 2017)
101050	MA CHI HANG	B.E.HONS.(UNI. OF SOUTHAMPTON)(CIVIL, 2010) M.Sc.(UNI. OF SOUTHAMPTON) (CIVIL, 2012)
100826	KOAY JYE YUEH	B.E.HONS.(UniMAP)(CIVIL, 2017)
100790	YONG LEONG KONG	B.E.HONS.(UNIMAS)(CIVIL, 2012)
100829	CHAN KHIN THUNG	B.E.HONS.(UNITEN)(CIVIL, 2003)
100670	AHMAD NAJMUDDIN BIN ABDUL HAMID	B.E.HONS.(UNITEN)(CIVIL, 2015)
100669	AUNI MAHSURI BINTI ZABUDIN	B.E.HONS.(UNITEN)(CIVIL, 2017)
101064	LIM CHUI MUN, MICHELLE	B.E.HONS.(UNITEN)(CIVIL, 2017)
99521	MOHAMMAD FAKHRI BIN AZIZ	B.E.HONS.(UNITEN)(CIVIL, 2017)
100929	ANG CHUNG CHERN	B.E.HONS.(UTAR SG LONG) (CIVIL, 2018)
100928	AU YOUNG WENG LONG	B.E.HONS.(UTAR SG LONG) (CIVIL, 2018)
100918	LIAN WEI KANG	B.E.HONS.(UTAR SG LONG) (CIVIL, 2018)
100915	LIM JACK HOONG	B.E.HONS.(UTAR SG LONG) (CIVIL, 2018)
100908	TAN WEI YEE	B.E.HONS.(UTAR SG LONG) (CIVIL, 2018)
100904	WILLIP LIM	B.E.HONS.(UTAR SG LONG) (CIVIL, 2018)
100901	YONG VUI FAH, NELSON	B.E.HONS.(UTAR SG LONG) (CIVIL, 2018)
100820	CHEN WEI HANG	B.E.HONS.(UTAR)(CIVIL, 2011)
100817	LOW ZE YANN	B.E.HONS.(UTAR)(CIVIL, 2018)
100808	MOHD KHAIRUL NAJMI BIN MOHD KAMARUDIN	B.E.HONS.(UTHM)(CIVIL, 2006)
101059	NOOR BAYZURA BINTI MOHD KASHIM	B.E.HONS.(UTHM)(CIVIL, 2011)
100810	HAYTHEM MOHSEN MOHAMMED	B.E.HONS.(UTM)(CIVIL, 2013)
100695	MOHD IDRUS BIN DIN	B.E.HONS.(UTM)(CIVIL, 1987)
100715	WONG TSUEY FEN	B.E.HONS.(UTM)(CIVIL, 1998)
100687	NUR MOHD FAIRUS BIN ABDULLAH	B.E.HONS.(UTM)(CIVIL, 2001)
100780	WAN MOKHTAR BIN WAN ISMAIL	B.E.HONS.(UTM)(CIVIL, 2003)
100666	DR. NORHIDAYAH ABDUL HASSAN	B.E.HONS.(UTM)(CIVIL, 2005) M.E.(UTM)(CIVIL-TRANSPORTATION & HIGHWAY, 2007) PhD.(NOTTINGHAM)(2013)
100895	UMMI KALTHUM BINTI ISMAIL	B.E.HONS.(UTM)(CIVIL, 2010)
100679	IZAM ZAIRIE BIN ISHAK	B.E.HONS.(UTM)(CIVIL, 2011)
100782	NUR IZZATI BINTI ABDUL AZIZ	B.E.HONS.(UTM)(CIVIL, 2011) M.Sc.(MALAYA)(PROJECT MANAGEMENT, 2017)
101060	TAN BOON KAI	B.E.HONS.(UTM)(CIVIL, 2012)
99525	LAU HUI HIE	B.E.HONS.(UTM)(CIVIL, 2012) M.E.(UTM)(CIVIL-STRUCTURE, 2013)
100804	HAMID MANSOOR ALI BADY	B.E.HONS.(UTM)(CIVIL, 2013)
101045	MOHD HAFIS BIN AHMAD	B.E.HONS.(UTM)(CIVIL, 2014) MPM.(UTM)(PROJECT MANAGEMENT, 2017)
100879	DAING MOHD HAFIZI BIN KHAIRI	B.E.HONS.(UTM)(CIVIL, 2015)
100660	EDRI AZLAN BIN MOHD AZNAN	B.E.HONS.(UTM)(CIVIL, 2015)
100871	AZROL EFFENDI BIN MOHAMAD	B.E.HONS.(UTM)(CIVIL, 2016)
100803	PERWIRA BIN KHUSAIRI RAHMAN	B.E.HONS.(UTM)(CIVIL, 2016)
101033	UMMU NAJWA BINTI LADZIM	B.E.HONS.(UTM)(CIVIL, 2017)
100885	MAS ELINA BINTI CHE JAMIL	B.E.HONS.(UTP)(CIVIL, 2008)
100788	WONG CHOON HWA	B.E.HONS.(UTP)(CIVIL, 2017)
100822	NURUL AFIQAH BINTI MOHAMAD ARBA'I	B.E.HONS.(UTP)(CIVIL, 2017)
100668	TEO SZE MENG	B.Sc.(SOUTH DAKOTA STATE UNI.)(CIVIL, 1999)
100784	ABDUL RAZAK BIN ABDUL LATIP	B.Sc.(THE UNI. OF ALABAMA) (CIVIL, 1987)
100721	TEOH SHENG LI	M.E.(THE UNI. OF MELBOURNE)(CIVIL, 2017)
101049	NG ZHAO LUN	M.E.HONS.(THE UNI. OF NOTTINGHAM)(CIVIL, 2018)
100870	SAW YONG XIANG	M.E.HONS.(THE UNIVERSITY OF SHEFFIELD)(CIVIL, 2015)

KEJURUTERAAN BAHAN

101058	YAP HUI CHEK	B.E.HONS.(USM)(MATERIALS, 2009)

KEJURUTERAAN BIO-MEDICAL

101032	LEE CHING YEE	B.E.HONS.(UTAR)(BIO-MEDICAL, 2015)

KEJURUTERAAN ELEKTRIKAL

100815	DR. SATHIABAMA T. THIRUGNANA	B.E.(NAGAOKA UNI. OF TECH.)(ELECTRICAL & ELECTRONIC SYSTEMS, 2000) M.E.(NAGAOKA UNI. OF TECH.)(ELECTRONIC, 2002) PhD.(WASEDA UNI.)(2015)
100697	MOHD TARMIZI BIN SALIM	B.E.(UMP)(ELECTRICAL-POWER SYSTEMS, 2009)
100723	LEOW HAN YOU	B.E.HONS.(CURTIN UNI. OF TECH.)(ELECTRICAL POWER, 2016)
100665	LEE CHEE LEONG	B.E.HONS.(LIVERPOOL JOHN MOORES UNI.) (MICROELECTRONICS, 2007) M.E.(UTAR)(ELECTRICAL, 2017)
100827	NURUL SHUHADA BINTI PAUZAI	B.E.HONS.(MALAYA) (ELECTRICAL, 2014)
100663	SAN WEI JIAN	B.E.HONS.(MALAYA) (ELECTRICAL, 2017)
100792	WONG JIN WEI, DANIEL	B.E.HONS.(SWINBURNE UNI. OF TECH.)(ELECTRICAL & ELECTRONIC, 2016)
100872	WONG SZE YEE, HANNAH	B.E.HONS.(SWINBURNE UNI. OF TECH.)(ELECTRICAL & ELECTRONIC, 2016)
100877	DR. NURFADZILAH BINTI AHMAD	B.E.HONS.(UiTM) (ELECTRICAL, 2010) PhD.(UiTM)(ELECTRICAL, 2015)
100821	MOHD FADZLI BIN MOHD NOOR	B.E.HONS.(UiTM)(ELECTRICAL, 2013)
100791	MUHAMMAD HAFIZ BIN ISMAIL	B.E.HONS.(UiTM)(ELECTRICAL, 2016)
100698	MUHAMMAD ASYRAFF BIN SURTAN ADAM	B.E.HONS.(UiTM)(ELECTRICAL, 2017)
100720	GOH CHONG HEEN	B.E.HONS.(UKM)(ELECTRICAL & ELECTRONIC, 2012)
100795	KUMARHESHAN VELLIAN	B.E.HONS.(UMS)(ELECTRICAL & ELECTRONICS, 2008)
101044	LIONEL JOSLIN	B.E.HONS.(UMS)(ELECTRICAL & ELECTRONICS, 2009)
100696	MUHAMMAD IZZAT LUQMAN BIN SHAHDAN	B.E.HONS.(UNI. OF WOLLONGONG)(ELECTRICAL, 2016)
101055	INTAN FAZLINA BINTI YAHAYA	B.E.HONS.(UniMAP) (ELECTRICAL SYSTEM, 2009)
100900	MOHAMAD ZULFADLI BIN ABDOL HALIM	B.E.HONS.(UniMAP) (ELECTRICAL SYSTEMS, 2012)
100876	MOHAMMAD FARHAN BIN HALIM	B.E.HONS.(UniMAP) (ELECTRICAL SYSTEMS, 2013)
101002	RAM SURENDRA PRAKESH	B.E.HONS.(UNITEN) (ELECTRICAL & ELECTRONICS, 2009) MEM.(UPM)(ENGINEERING, 2011)
100887	MOHAMAD SHAHID BIN SUHAIMI	B.E.HONS.(UNITEN) (ELECTRICAL & ELECTRONICS, 2016)
100785	ASHWINIKA KUMARAN	B.E.HONS.(UNITEN) (ELECTRICAL & ELECTRONICS, 2017)
100819	MOHAMMAD NURZAKWAN BIN NORAYEEN	B.E.HONS.(UNITEN) (ELECTRICAL POWER, 2011)
99530	MUHAMAD KHAIRI BIN MOHD KHALID	B.E.HONS.(UNITEN) (ELECTRICAL POWER, 2012)
101025	SAKTHIVEL A/L GANESON	B.E.HONS.(UNITEN) (ELECTRICAL POWER, 2015)
101056	MADHU SUTHARN RAJENTHRAN	B.E.HONS.(UNITEN) (ELECTRICAL POWER, 2016)
100867	ADAM BIN ZAINUDIN SABAI	B.E.HONS.(UNITEN) (ELECTRICAL POWER, 2017)
100813	DASHENI A/P PALANYCHAMY	B.E.HONS.(UNITEN) (ELECTRICAL POWER, 2017)
100806	TAMARAI A/P B GANADARAN	B.E.HONS.(UNITEN) (ELECTRICAL POWER, 2017)
99533	LEE CHEAN YONG	B.E.HONS.(UPM)(ELECTRICAL & ELECTRONICS, 2017)

Note: *Continuation of the Transfer Graduate, Graduate, Incorporated, Affiliate and Associate would be published in November 2019. For the list of approved "ADMISSION TO THE GRADE OF STUDENT", please refer to IEM web portal at http://www.myiem.org.my.*

THE MONTHLY BULLETIN OF THE INSTITUTION OF ENGINEERS, MALAYSIA

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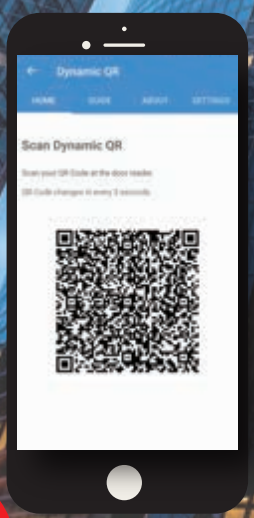

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