

# BUILDING THE PAST, ENGINEERING THE PRESENT, EDUCATING THE FUTURE



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The Immediate Past President, Past Presidents, Deputy President, Vice-Presidents, Members of Council, and my fellow engineers.

## **1.0 BUILDING THE PAST – A TRIBUTE TO OUR PAST ENGINEERING LEADERS**

Year 2009 marks a significant milestone in the history of the Institution of Engineers Malaysia (IEM) as it crosses the half-century mark of its formation. It has been 50 years since its birth on 1 May 1959 when IEM began its journey through uncharted territory, as the first professional institution dedicated to promote and advance professional engineering in all disciplines and to facilitate the exchange of information and ideas relating to engineering.

Let us refresh our memory on the history of formation of professional engineering organisations in our country. In 1932, an engineering association was founded in Kuala Lumpur. However, it did not last long. It was only after a few other unsuccessful efforts that a glimpse of achievement was attained with the formation of the Technical Association of Malaya (TAM) in April 1946. TAM was set up for all those in engineering, architectural and surveying disciplines. A joint group of the United Kingdom-based Institutions of Civil, Mechanical and Electrical Engineers was established in 1949 to service these professions. Arising to the increasing number of local engineers, the need to have a professional organisation dedicated to advance our profession was inevitable. Under the stewardship of our founding president the late Tan Sri Ir. Haji Yusoff bin Ibrahim and his team, the Institution of

Engineers Malaya was formed on 1 May 1959 and later renamed The Institution of Engineers, Malaysia.

Born exactly 20 months after Merdeka, IEM has been a constant force to post-independence nation building as Malaysian economy rose from an agriculture-based to a dynamic manufacturing- and services-based economy today. I am proud to say that engineering is the backbone of our country's economic growth. When Malaysia first gained our independence, we did not have much of an economy. Over the years, we have witnessed tremendous development in the infrastructure, manufacturing, telecommunications, information technology, construction, marine and automobile industries, and so on. Inevitably, engineering plays an integral role in creating the platform that stimulates and sustains our economy. Indeed, engineers have played an invaluable role in our nation building in the past 50 years and will continue to play a powerful role in bringing us closer to an environmentally sustainable and economically viable future.

Today, IEM, with a proud tradition of *50 years*, has grown from infancy to become one of the largest learned civil society organisations in our country. While there are still many areas for improvement, IEM can be proud of what have been achieved thus far. Starting with our humble beginnings of a small number of members, IEM is currently serving more than 24,500 members. With the membership base and the pool of engineering expertise available, IEM can claim recognition as the voice of engineers in

Malaysia that plays a pivotal role in upholding our professional status and image at national, regional and international levels.

The history of IEM could not have been written without the bold vision and foresight of our founding fathers and predecessors who have brought us to this milestone in our journey. On this historic occasion to commemorate our commendable legacy, I would like to specially pay tribute to our founding fathers, the Past Presidents and Council Members for nurturing this institution to what it is today. We are all indeed thankful to them and we salute their selfless dedication and tireless efforts in serving the institution. I would also like to thank all of you for your confidence in supporting me in assuming the office as IEM President for the year 2009/10 session. I will certainly need the advice and guidance from each and every one of you here, as we collectively take IEM to greater heights in leading the way ahead of the engineering profession.

## 2.0 ENGINEERING THE PRESENT: THREE ICS

The Year of 2008 was full of events. The petrol price went on a roller coaster last year. The world is now facing global economic uncertainties, triggered very much by the US subprime crisis. There is no exception back home. Malaysia's economy is also facing significant challenges and undergoing some restructuring. In a world full of changes, the only thing that does not change is the change and the only way to survive is to direct the changes to the right destination. As in the words of Charles Darwin, "it is not the strongest of the species that survive, nor the most intelligent, but the one most responsive to change". Indeed, as engineers, our ability to respond to change is the key to our survival. Therefore, we must engineer our own profession. We must be pro-active and creative. We must come up with new or alternative and yet cost effective engineering solutions. We must again be the prime movers for economic revival. You will be happy to note that at IEM we have seized all opportunities possible to serve our members and our nation better. For example, due to the collective efforts of IEM HQ and IEM branches approaching the relevant Government agencies, Ministries and state governments, engineers are now appointed to local councils and various advisory committees at state and national levels.

In the 21<sup>st</sup> century, globalization is a powerful driver of relentless change. The turn of the millennium witnessed a change in the world economy from the Atlantic Rim to the Pacific Rim. Asia currently comprises some of the world's most exciting economies. China and India, with their large population base and vast talent pool, are surging ahead as competing economies. In order to thrive in this fast advancing global market, all of us need to carry three ICs in our minds, in addition to our national IC. The first IC is Integrity and Competency; the second IC is Integration and Communication and the third IC is Internationalisation and Cooperation. Let me share with you some of my thoughts on these guiding principles for our future strategic direction.

### INTEGRITY AND COMPETENCY

Integrity is consistency between one's actions, values, methods, measures and principles. The value of a person is defined by the knowledge in the mind, the worth of the character and the principles upon which we build our life. Handling ethical dilemmas and making ethical decisions are important parts of being a professional. Engineering is a profession that has specialised knowledge, the privilege of self-regulation, and a responsibility

to the public. As engineers, it is important that we maintain a high ethical standard as the decisions we make will have a direct effect on the society. It is the awareness of these heavy responsibilities and obligations that lies at the heart of the professional code of conduct and ethics that govern the engineering profession. In the practice of the profession, engineers must adhere to high principles of ethical conduct on behalf of the public, clients, employers, and the profession.

Ethical misconduct seems to be the topics of everyday headlines and news. We are bombarded with stories about the moral failings of our political leaders and corporate leaders. Engineers are also not spared from public scrutiny. Whenever there is an engineering failure, the first reaction from the public is to pin-point engineers, sometimes even before any thorough investigation. Engineering ethics is attracting increasing interest in the nation as a result of the attention that the media has given to cases such as MMR2 cracks, NKVE bridge collapse, Matrade Building, the Bukit Antarabangsa Landslide, and the frequent floods. The voice of engineers, without fear or favour, be it from individual experts or from established institutions such as IEM, need to be heard among policy making bodies. Professional engineering organisations should initiate and conduct thorough studies and open discussions on the problems from the technical perspective. Engineers can share their ideas, offer solutions and engage in meaningful public discussion. It is timely for engineers to further promote a new culture of transparency and openness in-line with ethics and professionalism that we hold on to in order to protect the honour, dignity and integrity of the profession. It is my sincere hope that IEM continues to strive to be the profession's most respected voice on the practice of ethical engineering.

Clearly, in order to protect the safety, health and welfare of the public, engineers must be competent to provide professional service and advice. In a field as technically complex as engineering, new discoveries and changes in practice occur frequently. Engineers need to equip ourselves with everything we need to thrive in a very competitive world. Engineers will have to be equipped with the highest standards of R&D skills, keep abreast with global technological trends, be strategic thinkers and planners and develop market driven services and high-tech products/systems.

In order to stay current, engineers should continue their professional and ethical development throughout their careers to further enhance a greater level of professionalism and professional expertise. Engineers must take steps that go beyond their job, such as participating in professional societies, attending continuing education courses, gaining new skills and competencies in both technical and non-technical aspects through Continuous Professional Development (CPD) programmes, reading professional publications and developing a network of fellow professionals. The adoption of lifelong learning is imperative and has become a benchmark in responding to new challenges and demands posed by a highly competitive global market.

### INTEGRATION AND COMMUNICATION

The world is becoming increasingly integrated by information systems, economic markets and political social issues. These pose challenges that are growing in complexity and transcend specific disciplines and are driving the emergence of multidisciplinary and interdisciplinary thinking.

Innovations and technological breakthroughs are the product of convergence of multidisciplines. New multidisciplinary fields such as nanotechnology combine a host of related subjects from

biochemistry, pharmacology, and medicine to mathematics, computer science, and of course, basic engineering principles. Biotechnology, another field of great potential, merges engineering, physics, chemistry, biology, other life sciences and medicine. These, and other disciplines of the future, require engineers to master an overwhelming array of technical knowledge.

As we move towards a more knowledge-based and innovation-driven economy, engineers too will move beyond being technically equipped, towards obtaining an even wider range of expertise, such as in research and development, consulting, regulatory knowledge, leadership, management *etc.* Thus, inter- and multidisciplinary approaches are becoming more prevalent in engineering.

To operate successfully in a multidisciplinary environment, it requires a broad intellectual perspective. Equally important is the ability to manipulate information into knowledge as well as understand and communicate across disciplines. Similarly, engineers are tackling multifaceted problems that require solutions beyond the reach of any single discipline. Much of the work will involve teams of people, other engineers and people in disciplines such as science, marketing, finance, and information technology. In some cases, team members will work in other locations around the world. Thus, engineers must be able to collaborate and work in multidisciplinary and multicultural teams as well as communicate well in order to be effective in engineering itself.

The ability to communicate, both in writing and orally, will determine the chances of being successful as an engineer and advancing our career. As engineers we are required to write specifications and technical descriptions, prepare written status or progress reports to management, present design concepts to senior engineering management at design reviews, communicate technical information to staff members that have no technical training, prepare product brochures and marketing materials as well as prepare bids or other kinds of funding proposals. Therefore, our technical expertise, creativity and work ethics will not be enough if we are not able to communicate useful information to our colleagues, supervisors and clients.

## INTERNATIONALISATION AND COOPERATION

Globalisation, characterised by the increase in international trade, mobility of labour and capital, as well as borderless communications, presents new opportunities and challenges for engineering sector. The WTO (World Trade Organisation), the APEC (Asia Pacific Economic Cooperation) and the AFTA (ASEAN Free Trade Area) are developments of the concept of a borderless world. This borderless world will give participating economies the capacity for boundless prosperity. Trends such as the increasing transfer of technology, global mobility of engineers and trade liberalization have given rise to many issues that require co-operation and co-ordination. Our engineers should aim at achieving engineering excellence not only in our home country, but also contribute to the development of the region and the world. We can fly further and soar higher if we leverage on one another's strengths and broaden our intellectual and business networking.

In the regional landscape, engineering is one of the active service sectors in the ASEAN economic integration. The signing of the Mutual Recognition Arrangement (MRA) on Engineering Services in December 2005 by the ASEAN Economic Ministers reflected a shared interest between the governments and the engineering community in ASEAN to improve and enhance the competitiveness of engineering services quality as well as facilitating the free flow of engineering professionals within the

region. The momentum towards economic integration in ASEAN is further driven by the progress of ASEAN engagement in Free Trade Area (FTA) negotiations with an increasing number of its Dialogue Partners. These FTA's will encompass all aspects of the economy, including goods, services, and investment and thus will provide greater opportunities for ASEAN engineers.

In the last 20 years there has been a growing interest in multilateral agreements for engineering graduates, criteria for working independently and for the recognition of experienced engineers. Similarly, there are several initiatives undertaken by IEM to enhance the professional mobility of engineers within the globalization setup. Among these are the Engineers Mobility Forum (EMF), Asia Pacific Economic Cooperation (APEC) and ASEAN Engineers Register (AER).

The AER being a trade register for professionals within ASEAN is set up by ASEAN Federation of Engineering Organisations (AFEO) in which IEM is a founding member. The APEC register provides mobility for engineers between the signatory economies from Asia Pacific Rim. The EMF agreement is a multi-national agreement between engineering organizations of member countries providing the framework for the establishment of an international standard of competence for professional engineering. It empowers member organizations to establish a section of the International Professional Engineers Register. The standard of competence applied to the EMF is similar to that of the APEC Engineers agreement. These regional benchmarks should be maintained so that a regional level of confidence can be assured when clients utilise services of the professionals in these registers.

In addition, IEM is the permanent Secretariat of the Federation of Engineering Institutions of Asia and the Pacific (FEIAP). The task at hand is to work on the establishment of an Engineering Education Accreditation Procedure/System which will act as a platform for mutual recognition of engineering degrees across the region. Besides FEIAP, IEM is also an affiliated member of the World Federation of Engineering Organisations (WFEO). To provide opportunities for our engineers to share knowledge and expertise with their international counterpart, IEM has established Memoranda of Understanding with similar organisations in the US, UK, Australia and many others.

With the globalisation of professional services, local professional engineers should look beyond national boundaries and create winning partnership with foreign professionals and high technology industry leaders abroad. Moving forward, IEM would look into creating various business forums and platforms for members to network, exchange ideas explore business opportunities and promote their expertise overseas.

This era of globalisation has opened up boundless opportunities in the mobility of technical expertise within the region and the global community which will certainly contribute to the overall economic development of the region. In this regard, IEM shall continue its commitment in bringing the engineering profession to greater heights and to extend and strengthen our achievements and esteem around the globe, in the interests of our members and the profession.

## 3.0 EDUCATING THE FUTURE

I believe that addressing the fast paced, competitive, global environment of the 21st century requires redefinition of the role of universities in preparing tomorrow's engineers to face these challenges. Universities have to be responsive to all these changes

and realign themselves to produce graduates who are adept in working with the new paradigms. Engineering qualifications with emphasis on risk management, ethical practice and sustainable outcomes have become highly regarded by worldwide employers.

Engineering is a dynamic profession with the next generation of engineering career paths embracing complex systems issues. Examples include the issue of sustainable development such as conserving our Mother Nature, managing the increasing demand for energy resources and mitigating the effects of climate change; infrastructure systems renewal; nano systems and mega systems; living systems engineering which is a dimension beyond bioengineering; smart systems and creative enterprise transformation generally. The future challenge for the engineering profession will be the increasing diversity of the disciplines which are grouped under the umbrella of engineering.

Universities need to provide their students with greater experiential breadth of preparation in a variety of non-technical areas and simultaneously developing in them the foundation they need in a complex evolving discipline. There is a pressing need for broad-based engineers who have the ability to think logically and analytically, and be able to make wise decisions based on fundamental principles of engineering. Engineering students also need effective communication skills, grounding in social science, introduction to the principles of leadership and teamwork, entrepreneurial skills to translate their discoveries to practical use, solid foundation in ethics to discern the way their discoveries impact human societies, and a deeper appreciation for cultures. In other words, universities need to create inter- and multidisciplinary experiences for engineering students to parallel what they will experience in real life technological situations.

Professional bodies such as IEM should work hand in hand with institutions of higher learning to nurture competent engineers with critical thinking and analytical minds coupled with uncompromising integrity and ethical values. Policy maker, industry, society and universities should take greater steps towards establishing quality interaction and seamless working relationship.

Besides promoting the good work of the engineering profession, IEM, together with the tertiary institutions, should instil the right values in engineering education, and provide the necessary continuing education for the engineering profession. IEM may work with universities to establish engineering degree programmes that are of relevance in today's context. For example, there is a need to couple engineering programmes with business and law to train engineers who are both technically competent and ready to become entrepreneurs who are able to bring technological innovations from the laboratory to the market place. On top of that, the engineering discipline needs to attract its graduates to pursue postgraduate qualifications and raise the engineering skills to boost local innovation capability and research and development.

Moving ahead, as Malaysia develops into a knowledge-based and innovation-driven economy, we will have to continue to strengthen our engineering education and stimulate the growth of engineering population. Recognizing the importance of developing our nation's engineering manpower, IEM should place great emphasis on encouraging young and talented Malaysians to study engineering and ultimately build a career in engineering. On this note, IEM will initiate high quality outreach programmes to schools such as school adoption and back-to-school programmes to get more students from lower secondary onwards to be interested in mathematics, science and technology and of course, to promote

engineering as an exciting profession. This is also in tandem with our government's effort to produce suitably equipped human capital especially in science and technology for nation-building to further enhance our economic competitiveness and transform Malaysia into a vibrant global nation.

#### 4.0 MOVING FORWARD

Ahead of us, it will be a challenging job, especially when we are on the brink of re-engineering our institution to ensure IEM is well positioned to meet the needs and expectations of an evolving engineering society.

What is the role of IEM as a membership driven society? As we all know, membership is the lifeblood of our institution. Without our members, IEM does not exist. Therefore, recruiting, servicing and retaining our members is the cornerstone of our survival. In order to achieve membership satisfaction and loyalty, IEM needs to understand the needs and expectations of the diverse segment of our members. Next, we need to analyse and assess whether our positioning of membership offer and services match those needs and expectations. We should also bear in mind that these needs and expectations will change with time.

For IEM to remain relevant and appealing to the engineers, it has to evolve to enhance the value of IEM membership. To inject professional and intellectual values to IEM membership, IEM will provide a myriad of avenue for members to improve themselves. Professional training will be increased to provide more opportunities for members to gain CPD hours nation wide. We want to make IEM as the lead body for all engineers. As part of our membership drive, we would like to attract more professionals from the industry especially the manufacturing and service sectors into IEM fold.

Besides continuing the on-going efforts to raise fund for our newly acquired building, we will have to move into high gear to steer ourselves to focus on other initiatives that have been stated earlier such as establishing seamless relationship and collaboration with institutions of higher learning, policy makers and industries; stimulating the growth of engineering graduates within our population; improving IEM's responsiveness to current issues; providing opportunities for business networking and maintaining the highest standards of the profession through international and global alliances. The world is changing rapidly and we, as professionals, must keep pace and work at re-engineering process with ultra speed in order to remain the premier professional organisation in the country.

#### 5.0 CONCLUSION

Today, we have the baton in our hands. Let us embrace the esprit de corps as we, the engineers, continue the marathon with courage and determination to rise to the challenges that lie ahead of us. For this, I seek your strong support as well as enthusiasm as we pledge our sincere commitment to the betterment of the Institution, our profession and above all, our nation. May the vision and drive of our Founding Members live on. ■

#### REFERENCES

- [1] "Engineers in Nation Building", Board of Engineers Malaysia 30<sup>th</sup> Anniversary Commemorative Book, 2002