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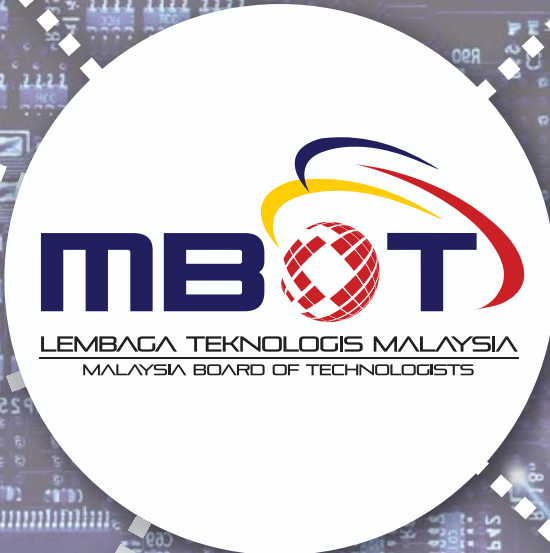


INAUGURAL EDITION

TECHies

01

Oct - Dec 2016



An Exclusive Interview with the President

» 6



The History and Future of Public Technical Universities in Malaysia

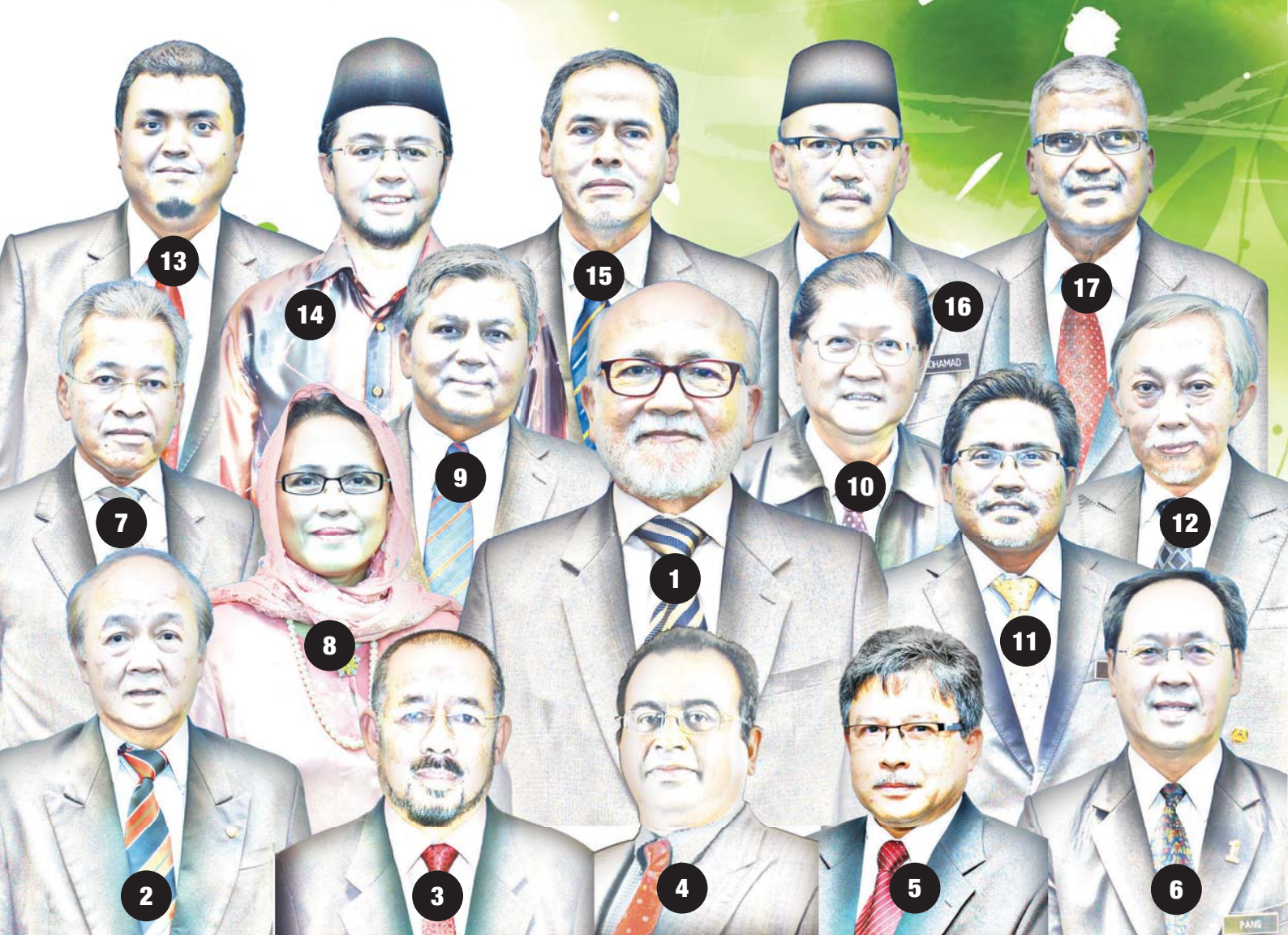
» 8



The Development of Skilled Workforce

» 14

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WELCOMING REMARKS FROM THE HEAD OF PUBLICATION COMMITTEE

Nothing excites me more than introducing our first TECHies Bulletin. This special edition is to officially introduce the Malaysia Board of Technologists (MBOT) to the public. It is MBOT's ultimate goal to uplift and honour the profession of technologists in the country.

In this edition, we feature a special foreword from YB Datuk Seri Panglima Madius Tangau, Minister of Science, Technology and Innovation (MOSTI). We also interviewed the President of MBOT, Tan Sri Dato' Academician (Dr.) Ir. Ahmad Zaidee bin Laidin, conveying his aspirations in leading MBOT forward. We also feature articles written by our team and guest journalist. These articles include the history behind the establishment of MBOT, the birth of the Malaysia Technical University Network (MTUN) member universities, and University Kuala Lumpur as leading universities in technical programmes. We also bring you the latest in global leading technology in the Internet of Things (IoT).

TECHies shall be the voice of MBOT, disseminating MBOT's effort in its journey towards achieving its goals. We will communicate technology to the masses and its stakeholders continuously, capture the significant development in the discipline, and create a platform for the technology community to share their thoughts and ideas.

I hope TECHies will be able to play a crucial role in highlighting the contribution of technologists in Malaysia, subsequently communicating technology to the public. We welcome students, industries, educators and the public-at-large to contribute and drive this Bulletin, making it more lively, exciting, and connecting. Write to us and we will be happy to hear from you.

Datin Paduka Ir. Dr. Siti Hamisah Tapsir
Editorial Adviser / Board Member



INSIDE

4

WELCOMING REMARKS

from the Honourable Minister of Science, Technology and Innovation (MOSTI)

YB Datuk Seri Panglima Madius Tangau (MT)

5

ICE BREAKING

About Malaysia Board of Technologists (MBOT)

6

EXCLUSIVE INTERVIEW

A New Defining Chapter for Technology Development in Malaysia with Tan Sri Dato' Academician (Dr) Ir. Hj Ahmad Zaidee bin Laidin FASc

8

MTUN : The History and Future of Public Technical Universities in Malaysia

10

UniKL : Pioneer in Higher Technical Vocational Education and Training (HTVET)

11

MBOT Logo Design Competition Result

12

City of the Future : Trend of Smart City

14

The Development of Skilled Workforce through Skills Training

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WELCOMING REMARKS FROM THE HONOURABLE MINISTER OF SCIENCE, TECHNOLOGY AND INNOVATION (MOSTI)

YB Datuk Seri Panglima Madius Tangau

The idea to establish MBOT was introduced in the 10th Malaysia Plan (10th MP 2011-2015), with the objectives of broadening access to high quality Technical and Vocational Education & Training (TVET) programmes and improving public perception of TVET as a career of choice. Its establishment is the result of lengthy consultations and discussions with various quarters, comprising the government, the education sector, and the industry. MBOT supports the National Science, Technology and Innovation Policy that aims to increase skilled and competent technical workforce and to develop a dynamic career path for technologists.

Without a doubt, technology and skills are the linchpins of progress for any nation, and an adequate number of graduates must be prepared for the world of work in this globally fast-changing economy. The recognition of technologists and technicians

is vital to ensure exceptional quality in services rendered. This is done by regulating the conduct and ethics of professional technologists and certified technicians. Besides TVET, MBOT also broadens its scope to include other technological professions like researchers and scientists. As it is, Malaysia has a well-deserved reputation for the quality of our technologists. However, to fully realise our potential, we must do more to better acknowledge this profession.

I always emphasise on the building of science, technology, engineering and mathematics (STEM) talent today to enable us to withstand increasing competition from other countries and to meet the demand of the industry in the future. Without the appropriate STEM talent, Malaysia will not be able to move towards an innovation-led economy. The establishment of MBOT is aligned with the country's aspiration towards achieving 60:40 ratio of

STEM to non-STEM enrolment. However, without a professional body to effectively govern STEM professions, this ratio will remain just a number. This is where MBOT will play its role, which is to certify STEM-related professions, and to enable Malaysia's transition from being an end-user of technology to being a technology inventor.

We must swiftly identify new and emerging technology fields so that MBOT remains relevant. Hence, we need to leverage on our strengths, honestly identify our shortcomings, and come-up with necessary initiatives to move forward. After many months of deliberation, I am very proud to present MBOT to the people. Indeed, we are committed to making a difference to the country's well-being through the development of world class technologists and technicians.

ABOUT MBOT

The Parliament of Malaysia has enacted the Technologists and Technicians Act 2015 (Act 768), an act to provide for the establishment of Malaysia Board of Technologists (MBOT), in line with other professional bodies in Malaysia.

MBOT is responsible for the registration of graduate technologists and qualified technicians as well as to recognise professional technologists and certified technicians.

MBOT promotes education and professional training in the related technology and technical fields.

MBOT recognises technological careers and empowering technical and vocational education and training (TVET).

MBOT will strive to be a signatory to international accords in the field of technology and technical to ensure the technologists and technicians produced in the country meet the international standards and ability to compete globally.

VISION

To be a world class professional body for technologists and technicians

MISSION

To elevate the standing, visibility and recognition of technologists and technicians

OBJECTIVES

- To elevate the standing and recognition of technologists and technicians
- To increase the pool of skilled workforce required to attain a high income economy
- To protect public safety and health

WHO SHOULD REGISTER



Graduate Technologist

- Holds a bachelor's degree recognised by the Board.



Professional Technologist

- Graduate Technologist with practical experience as stipulated by the Board.



Qualified Technician

- Holds a certificate qualification recognised by the Board.



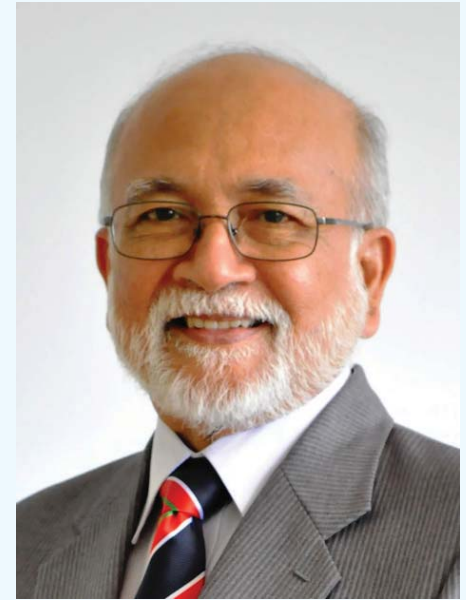
Certified Technician

- Qualified Technician with practical experience as stipulated by the Board.

Malaysia Board of Technologists (MBOT): A New Defining Chapter for Technology Development in Malaysia

An Exclusive Interview with
Tan Sri Dato'Academician (Dr.) Ir. Hj Ahmad Zaidee bin Laidin FASc
President of MBOT
By Dr. Eida Nadirah Roslin

In this exclusive interview, Tan Sri Dato' Academician (Dr.) Ir. Hj Ahmad Zaidee bin Laidin FASc, President of MBOT, was thoughtful in defining the importance of MBOT and the role it is going to play in strengthening the technology sector in Malaysia.



QUESTION 1 Why is it important to establish MBOT in Malaysia?

The starting point for the establishment of MBOT was the Economic Transformation Programme (ETP), an initiative by the Malaysian government to turn Malaysia into a high income nation by the year 2020. According to a study done by the Organisation for Economic Co-operation and Development (OECD), in 2010, only 10% of students were enrolled in upper-level secondary technical and vocational education. In OECD countries, the average enrolment rate was 44% (EPU, 2010). Therefore, there was a clear need to increase TVET enrolment rates in Malaysia. Looking at this situation, the idea of setting up MBOT was first put forward during the 10th Malaysia Plan. MBOT provides the platform for technology and technical graduates to be recognised once they enter the workforce. MBOT's mission is to elevate the standing, visibility and recognition of technologists and technicians in Malaysia. It uses the Canadian Council of Technician and Technologist as its reference, with some measure of adaptation to suit our local requirements.

QUESTION 2 In the 10th Malaysia Plan, the development of TVET was identified as an important agenda to transform our nation into a developed country. In your opinion, what are the roles of MBOT in supporting this agenda?

TVET has been identified as one of the critical enablers in the success of our Economic Transformation Programme (ETP). MBOT is to inculcate the philosophy of creating highly-skilled technologists and acknowledging their importance. It should be able to lead in supporting this agenda by examining our current status, and benchmarking it against other successful OECD nations.

As it is, many of our domestic investments are into infrastructure building. The successful completion of projects depends not only on the capability of the engineers involved, but also on the many workers who have high TVET skills. TVET encompasses many small jobs that contribute to major technological advancements. Developing skill competencies through involvement with mega projects has been the key for Malaysia in advancing its workforce.

QUESTION 3 What are the pertinent issues and important challenges in developing MBOT?

The biggest challenge is to change people's mindset towards acknowledging TVET as a highly regarded profession. The performance of MBOT lies in its ability to protect and safeguard technicians and technologists. Besides, MBOT must also acknowledge three crucial areas, namely salary levels, specific roles and reward & recognition.

QUESTION 4 What is the expected impact in Malaysia's development with presence of MBOT in empowering technologists to a new level?

The collective concern of MBOT is in determining a 'fair rate' on performed jobs, at a certain quality level, of a certain job function. The higher the level of skills needed, the higher the compensation needs to be. The recognition must be linked to a fair reward system, so as to create sustainable drive and motivation. Ensuring that we are continually relevant is important. MBOT must continue to identify which areas of technology are growing and which ones are phasing out. Technologists and technicians of the future are going to need a range of skills and the ability to adapt. Indeed, we do not know what technology we will be using in the future.

QUESTION 5 Can you describe the first major initiative to be executed once MBOT starts functioning?

The first initiative is to create a buzz and to publicise MBOT's founding. The public must be made to know of its existence, what it is here to do and which direction it is heading. It is vital to start at the grass root level and to build a strong foundation about its purposes, aims and aspirations.

QUESTION 6 As President of MBOT, what are your aspirations and visions towards producing high skilled, capable and world-class technologists in Malaysia?

First, we need to understand where we are and to benchmark ourselves against other countries. Second, we need to look at our regional competitors. For instance, we should look into how other ASEAN countries are doing and see where we stand in relation to them.

Then, MBOT has to consolidate crucial information and the necessary know-how to develop good technologists. It is essential to cover the whole aspect of developing technologies in Malaysia and to match them with the necessary skills needed.

The establishment of MBOT is important because it fills up the void present in the nation's professional structure. MBOT regulates this specialisation and acknowledges the status of TVET, just like any other professional fields. TVET should be represented by its own board. The talent mobility of TVET graduates is crucial, in that they should be given opportunities to move upwards from the bottom. Exposure to technological and technical areas should start at the school level. The aim is to have competent technologists produced locally, but with acclaimed international recognition. The technologists produced should be able to work anywhere in the world with the necessary skills garnered through world-class TVET education programmes.



“ MBOT aspires to be a world class professional body for technologists and technicians... ”

Tan Sri Dato' Academician (Dr.) Ir. Hj Ahmad Zaidee bin Laidin FASc

Biography

Tan Sri Dato' Academician (Dr) Ir Hj Ahmad Zaidee bin Laidin FASc was appointed as President of MBOT on 18 November 2015 by the Minister of Science, Technology and Innovation. He is also Fellow (FASc) of Akademi Sains Malaysia (ASM). He was the first Vice-Chancellor of UiTM in 1999.

The History and Future of Public Technical Universities in Malaysia

By Assoc. Prof. Dr. Muhammad Fahmi Miskon

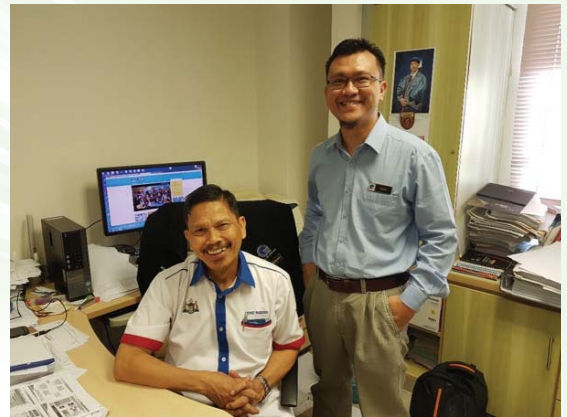
This article was produced through an interview session with **Datuk Professor Dr. Mohd Ruddin Ab Ghani, Fellow (FASc) of Akademi Sains Malaysia (ASM)**. **Datuk Professor Dr. Mohd Ruddin Ab Ghani** also chairs the **University Professor's Council of UTeM**.

“ It is the responsibility of an academician to continuously work towards holistic excellence in acculturating knowledge especially in the areas of science and technology for the benefit of all ”

Datuk Professor Dr. Mohd Ruddin Ab Ghani

Background

The idea to establish a technical-based institute came into picture in April 1999. It was suggested by the cabinet members that Malaysia should have a number of technical-based institutes of higher learning which run on 70% hands-on and 30% theory. A school system having two streams, namely academic and technical/vocational, was proposed in the cabinet committee report in 1979. At the end of the 7th Malaysia Plan, there were 90 technical schools with 36,000 students. At that time, technical school-leavers could not enrol for Bachelor degree because most Bachelor degree programmes offered in public institutes of higher learning (IHLs) were delivered using theoretical approach. Technical and vocational students could only enrol up to Diploma level, as this was the highest education rank that used practice-oriented approach in the delivery of courses. Diploma graduates back then came from polytechnics, British Malaysian Institute (BMI), German Malaysian Institute (GMI), Malaysia France Institute (MFI), and government public skill centres (IKM). This concern was raised in a Vice-Chancellor Conference on 9 June 1995. A new approach of higher learning that would integrate theory and practical skills was seen as essential in order to increase the number of skilled engineers. The establishment of technical universities was a proactive move to open the doors to higher education for those who come from technical and vocational backgrounds.



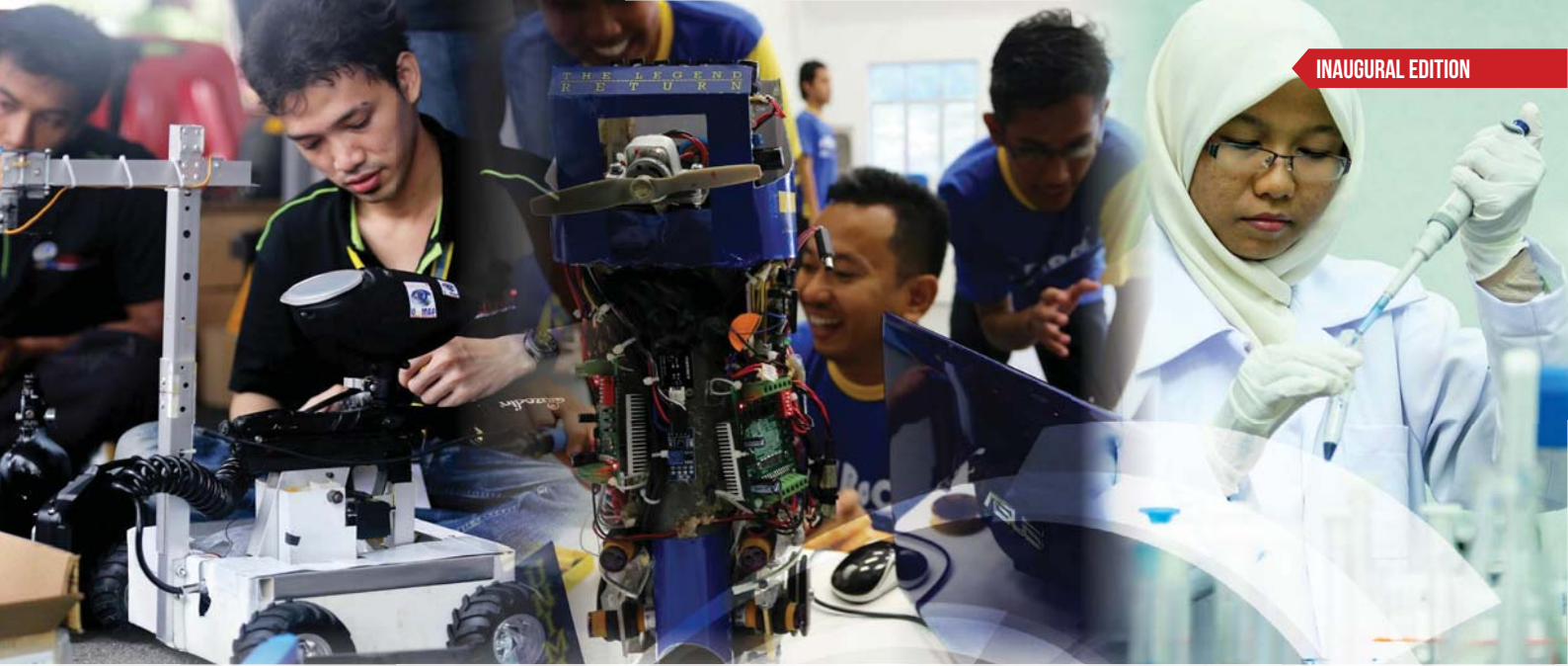
The rationale behind the founding of technical universities

The establishment of technical universities increases the chance of technical and vocational students to further their studies in a learning mode that promotes hands-on training. Practical competencies, when complemented with theoretical learning, produce cutting-edge talents with excellent development potential.

In order to attain sustainability, a developed nation requires a ratio of 40% engineering scientists (involved in research, design and planning activities) and 60% engineering technologists (involved in manufacturing process, operation, services and maintenance activities). This is to balance the workforce in an industry-centric nation. Technical university graduates will complement existing public IHLs in producing a balanced supply of workforce. For this reason, eventually, four university colleges were established:

- 1** Kolej Universiti Teknologi Tun Hussein Onn (KUITTHO) - 27 September 2000
- 2** Kolej Universiti Teknikal Kebangsaan Malaysia (KUTKM) - 1 Disember 2000
- 3** Kolej Universiti Kejuruteraan dan Teknologi Malaysia (KUKTEM) - 16 Februari 2002
- 4** Kolej Universiti Kejuruteraan Utara Malaysia (KUKUM) - 16 Februari 2002

On the 1st February 2007, all the university colleges were rebranded into Universiti Tun Hussein Onn Malaysia (UTHM), Universiti Teknikal Malaysia Melaka (UTeM), Universiti Malaysia Pahang (UMP) and Universiti Malaysia Perlis (UniMAP).



The uniqueness of MTUN universities

The concept of technical universities differs from existing public IHLs particularly in the learning-teaching approach, the type of intake, and the strength of industrial involvement. The curriculum and learning approach are centred on practical-training and application of knowledge. It integrates the theory and practical sides of learning, and focuses on industrial problems through experiential and action learning. The composition of a typical course is 30% hands-on, 30% general fundamental knowledge and 40% specialised fundamental knowledge. Lectures and tutorials are carried out in small-sized classes and delivered by lecturers having industry experiences. The learning modules are flexible and student-centred as they are tuned to the student's capability and interest. Intakes of MTUN universities are candidates having Matriculation qualification, STPM, SPM/SPMV, Diploma, certificates, and experienced workers, especially those with Malaysia Skill Certificate. Industrial involvement is one of the most important strategic factors to ensure that graduates are able to fulfil industrial demands. This is gained through smart partnerships with the industry. The courses and programmes are designed with input from industrial advisory panels. Among the programmes carried out with the industry are staff attachment, industrial training, industry talks, and many others. All the programmes give exposure to the participant on practices, issues, and problems found in the industry.

Critical success factors of technical universities

It is important for technical universities to maintain low student-to-staff ratio in order to provide sufficient facilitation and to allow close supervision and monitoring. The staff should be equipped with industrial experiences so as to be more emphatic in what the industry expects from the students. Student-to-equipment ratio should also

be low to ensure each individual has sufficient opportunity to experience the application of knowledge. Technical universities must have continuous support from the industry in terms of developing industry-driven curriculum as well as in the provision of resources to support the learning process. Finally, technical universities must be creative and innovative in learning and teaching practices, taking into account limited resources and considering the relevant accreditation body's requirements

The future of technical universities

MBOT is a platform that recognises professional technologists and certified technicians as professionals. It also monitors and regulates their practices. Through this platform, graduates of technical universities will have the opportunity to be recognised as professional technologists. MTUN engineering technologist programmes provide an alternative route into becoming professional engineers, with the addition of several courses taken at a post-graduate level. It is envisaged that technical universities will become important producers of professionals in the nation.

The establishment of technical universities is a vital mechanism in supporting Vision 2020 and beyond. Technical universities also play an important role in the Malaysia Education Blueprint Shift number 4: Quality TVET graduates in high technology industries. Technical universities should address industrial demands in a more focused manner. They should be quick in responding to the nation's needs, particularly in high technology industries.

Universiti Kuala Lumpur: Pioneer in Higher Technical Vocational Education and Training (HTVET)

By Dr. Mohamad Asmidzam Ahamat, UniKL MFI



Overview of Universiti Kuala Lumpur

Universiti Kuala Lumpur (UniKL) is a leading university in engineering technology. It is part of the education group owned by *Majlis Amanah Rakyat* (MARA), an agency under the Ministry of Rural and Regional Development (KKLW). It was set up based on the foresight to form Malaysia's first privately-owned technical and entrepreneurial university. It was formed via the amalgamation of seven MARA skills institutions in 2002, and has seen rapid expansion as one of the universities of choice in Malaysia. The vision of UniKL is to be the leading entrepreneurial technical university and its

mission is to produce enterprising global technopreneurs. UniKL is committed towards uplifting the status of higher technical and vocational education and training in Malaysia.

“ One Institute, One Specialisation ”

Adopting this concept, UniKL has 14 institutes strategically located all over Malaysia, with its Chancellery situated in the heart of Kuala Lumpur. All the institutes are equipped with state-of-the-art facilities to assist in curriculum delivery, which emphasises on hands-on and technical skills development. The diversity in specialisation within the university enables the optimisation in the utilisation of resources. It also enhances teaching and learning activities, supports research activities, and augments postgraduate supervision. Currently, UniKL offers 131 programmes from foundation to doctorate levels.

To further boost teaching delivery, UniKL has more than 70 academic partners and at least 60 industrial and technology partners locally and internationally. Certain degrees offered by the university are jointly awarded with other institutions.

Achievements

UniKL has achieved sustainable growth in the last 12 years amidst a rapid rise in its student population since its inception in 2002. This is apparent in the number of student enrolment, financial sustainability, staff qualification, graduate profiling, and diversification of income. Since its establishment in August 2002, UniKL has produced more than 37,000 market-ready graduates who are equipped with technical, social, learning and entrepreneurship fundamentals.

As recognition to UniKL's excellent curriculum delivery, the university was classified under the 'excellent' category by the Ministry of Higher Education and the Malaysian Qualification Agency (MQA) in the Rating for Higher Education Institutions in Malaysia (SETARA). In the previous three consecutive assessments, UniKL was rated as TIER 5 in SETARA' 09, SETARA' 11, SETARA' 13. These achievements signify the quality of teaching and learning of the university.

In UniKL, academics and students actively participate in innovation competitions locally and internationally, and have been awarded numerous awards in innovation and technological exhibitions worldwide. UniKL is also actively involved in the World Skills Competition held annually worldwide. It was recently honoured as Malaysia's Preferred Brand for Higher Education at the 2016 Putra Brand Awards. Winners of the Putra Brand Awards, popularly dubbed "the People's Choice" awards, were voted by more than 6,000 respondents through an independent nationwide survey. Other achievements include bronze award winner in the "Education & Learning" category, a significant milestone in recognition and trust in UniKL.

Way Forward

As one of its initiatives to improve delivery in technical education, UniKL has developed its own Value-Based Higher Technical, Vocational Education and Training Educational model. This model is set to produce human capitals that are innovation-driven, entrepreneurial, ethical and professionally skilled in science, technology and trades.

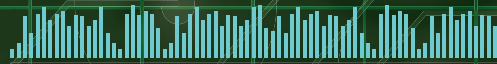
By the year 2020, UniKL aims to become one of Asia's top universities by offering enriching university experiences, particularly in higher technical vocational education and training (HTVET).

To be on the global arena, UniKL must strategically position itself as the leading local institution for technical and entrepreneurial programmes and vocation. It needs to actively champion, market and spread the message of HTVET in its programmes, and truly become the apex of technical universities in Malaysia.

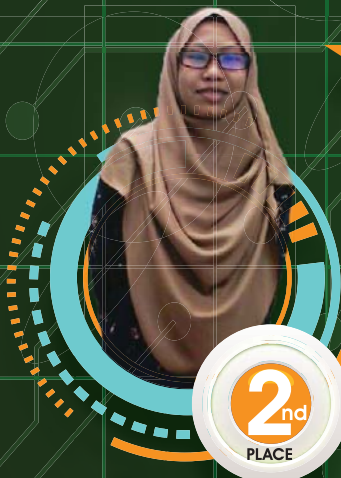
MBOT LOGO DESIGN COMPETITION



Congratulations



Mohd Rais Bin Mohd Yusof,
Politeknik Muadzam Shah



Nurul Izzati Binti Ahmad, **UTeM**

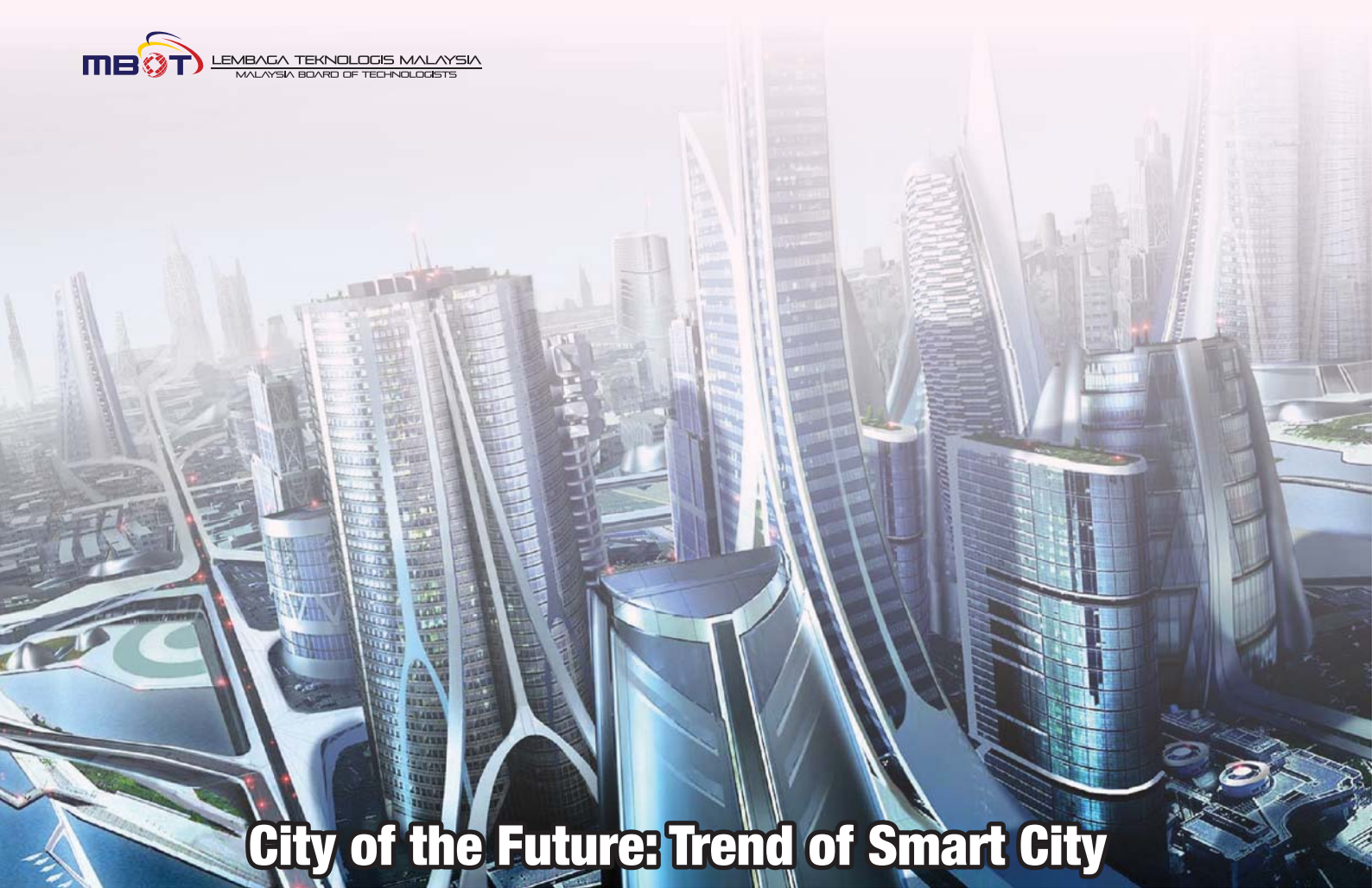


Mohamad Khairi Bin Shari, **KK JASIN**



CONSOLATION PRIZES

- A
 Mohamad Azan Bin Kamarul Azhar, **UTeM**
- B
 Mohamad Faiz Bin Mohd Nasir, **UTM**
- C
 Muhammad Hariz Bin Anuar, **UNISZA**
- D
 Nasrullah Bin Nor Rizad, **UniKL MIIT**
- E
 Qaddafi Bin Sezili, **UniKL MIIT**



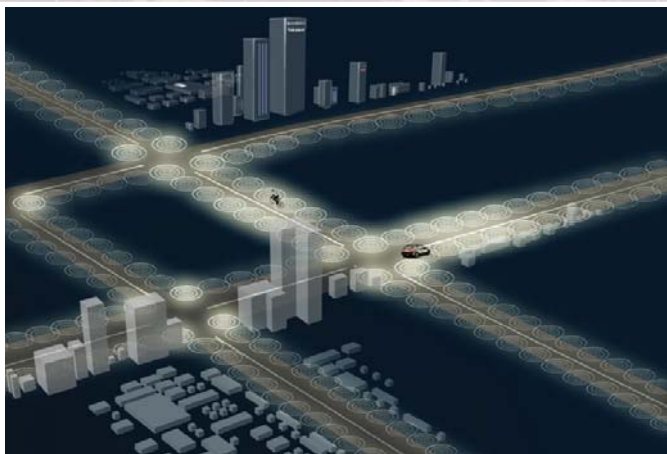
City of the Future: Trend of Smart City

By Assoc. Prof Dr. Kushsairy Abdul Kadir

Cities used to grow on strategic locations. The location usually makes sense, such as on a hill or somewhere near to resources or the merging of two transportation routes. Take Kuala Lumpur for example, a city where two rivers meet. It covers an area of 243 km², with an estimated population of 1.7 million in 2015. It is one of the most rapidly growing cities in South-East Asia. With the advent of technology, it is possible that some day, Kuala Lumpur will transform into a Smart City, where everything is electronically integrated - schools, hospitals, transportation systems, and many more.

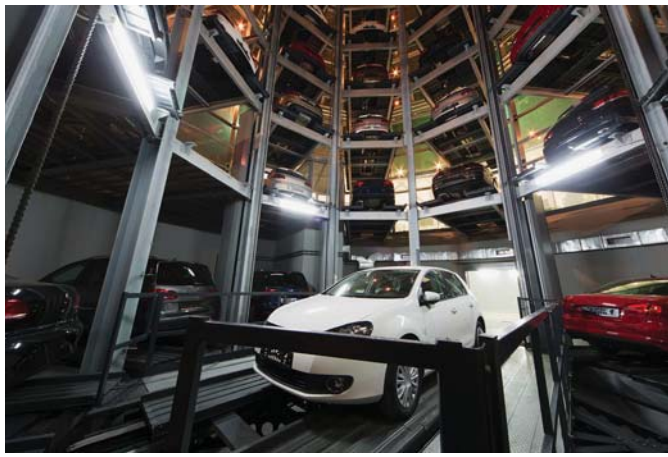
A smart city is an urban development vision that integrates communication technology (ICT) and the Internet of Things (IoT). It has smart connected sensor systems, smart processing & actuating systems, smart personal devices, big data processing, and smart energy & power management. A smart city is built on the awareness and real-time control of all critical city infrastructures. It is where the citizens of the city and their smart things are the central players. As people say, you do more with less; that is what smart things mean.

In a smart city, technologies converge to accentuate economic development. Activities carried out in the city are sustained by virtue of being supported by success-oriented market drivers such as supply and demand. Some of the trends in creating a smart city are described below.



Smart Street Lighting

In a smart city, networks of smart street lights are individually controlled. Using remote activation, street lights function seamlessly and can be lighted up at the right time. This enables precise illumination of various urban areas according to needs and in a concerted way – city centres, main thoroughfares, residential streets, tunnels, parks, and many more. Another application of smart street lighting is that, it acts as a multi-functional station. Besides providing traditional lighting, it serves as data stations with sensors for environmental monitoring as well as for communicating information.



Smart Parking

The congestion caused by poorly managed parking frustrates drivers, wastes fuel, and creates air and noise pollution. Smart parking solution helps drivers find parking spots faster and enables cities to manage their parking spaces efficiently. Car detection sensors can be embedded in the road and drivers can be directed to the nearest empty parking space much faster just by using their smart phones. Can you imagine not having to wander around KLCC parking just to look for the green light? It would be such a relief.

Smart Waste Management

This is what we Malaysians really need! We produce tonnes of waste every day. Waste management is indeed a major problem in many big cities. Current waste collection logistics are taken out by emptying containers according to predefined schedules and routes, which are duplicated at a set frequency. The current waste collection is time consuming because the garbage vehicles need to go and empty containers whether or not they are full. This causes high management cost, traffic congestion, increased noise, and air pollution. Smart sensing and connectivity optimise the waste management system, where the connected garbage trunks would have real-time information on the fill level of the containers. This information is then fed to a centralised real-time control and data centre to configure the routes of the garbage vehicle. Smart waste management allows cities to provide better waste management and in the end better service to its citizens.



Smart Home

Smart cities have smart homes. From intelligent locks to home entertainment, the smart home will provide seamless connectivity to the internet. A house can be made to be a big intelligent device by integrating smart appliances to the internet. The Internet of Things will make smart homes more popular in the future.

Smart Metering

Smart meters allow power generation to match consumption in a more efficient way and give users control over their usage. Smart meters provide consumers with precise details of consumption patterns, thus allowing better management in the use of electricity. Electricity suppliers can offer a flexible tariff scheme and billing, which better reflects the actual cost of generating the electricity in a given period. For example, there will be peak, off-peak, day, and night charges.



Challenges

The realisation of smart cities is not without challenges. Its success depends on the city dwellers' adaptation to these technologies, especially for the baby boomers. Cost and funding are also big challenges; the question is always: who should bear the cost of developing smart cities? To add, there is also the time factor -- smart cities take a very long time to build -- typically some 20 to 30 years. Finally, there is the issue of privacy and security of data because in smart cities, vast amounts of data are generated each day and these data are prone to abuse.

development & training

The Development of Skilled Workforce through Skills Training

By Department of Skills Development (DSD)

Malaysia is moving towards becoming a developed country by the year 2020. The quality of human capital is a critical element in the realisation of this aspiration. The need for skilled human resource in the era of knowledge-based economy is the underlying basis of success. Therefore, a concerted strategy has to be put in place to coordinate the efforts of all agencies involved in human capital development.

The Department of Skills Development (DSD), which is under the Ministry of Human Resources, was tasked to coordinate and regulate the implementation of skills training. The National Occupational Skills Standard (NOSS) was jointly developed by the Government and industry experts as a tool for quality coordination. It acts as the reference point for awarding the Malaysia Skills Certificate (MSC). To-date, DSD has accredited 1,200 training institutions that have successfully met with the required standard.

With the National Skills Development Act 2006 (Act 652) or NASDA coming into force in June 2006, the role of DSD is more strategic and focused. DSD is responsible to:

01

Advise the Government on policies related to skills training

02

Coordinate the skills training policies at the national level

03

Facilitate the industry's involvement in skills training and ensure that skills training provided is industry driven according to NOSS

04

Prepare a quality assurance system for public and private training providers.

ACKNOWLEDGEMENT

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