READYING THE E&E INDUSTRY FOR GROWTH

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THE United States-China Trade War has created a window of opportunities for Malaysia to capture more investments.

According to Electrical and Electronics Productivity Nexus (EEPN) Key Strategy 1 chairman Dr Hari Narayanan, the country should take advantage of these opportunities by focusing on the top concerns of industry, which is talent supply, especially for the electrical and electronics (E&E) industry.

"To do this, we need concerted effort among industry, government and universities.

"The E&E industry continues to receive investments, both from foreign multinational corporations and local companies and we need to ensure that these expansions are not hampered by the lack of engineers."

"Additionally, we need to assist companies to move up the value chain – from manufacturing to design and development to providers of solutions.

"The bottom line is: the war for global talent will continue to intensify; the E&E industry continues to expand and evolve at a faster rate than most other industries. Therefore, we need to be unrestricted by talent supply," he said, when explaining the importance of ensuring that the country has a good supply of industry-ready engineers.

To achieve this, EEPN has embarked on several key initiatives.

He added, "In the area of manufacturing, product, process, equipment and maintenance engineers, we have customised advanced industrial upskilling programmes.

"We also have Masters programmes in targeted areas and SME leadership development programme to complement the technical programmes."

Additionally, to assist companies to adopt the appropriate fourth industrial revolution (IR4.0) elements in their operations, it has organised Plugfest 1.0, which focuses on industrial Internet of Things, Plugfest 2.0, artificial intelligence (AI)-based machine vision system and webinars on IR4.0 by EEPN technology centres. It has also engaged RWTH Aachen University, Germany to provide advanced upskilling in terms of IR4.0 training.
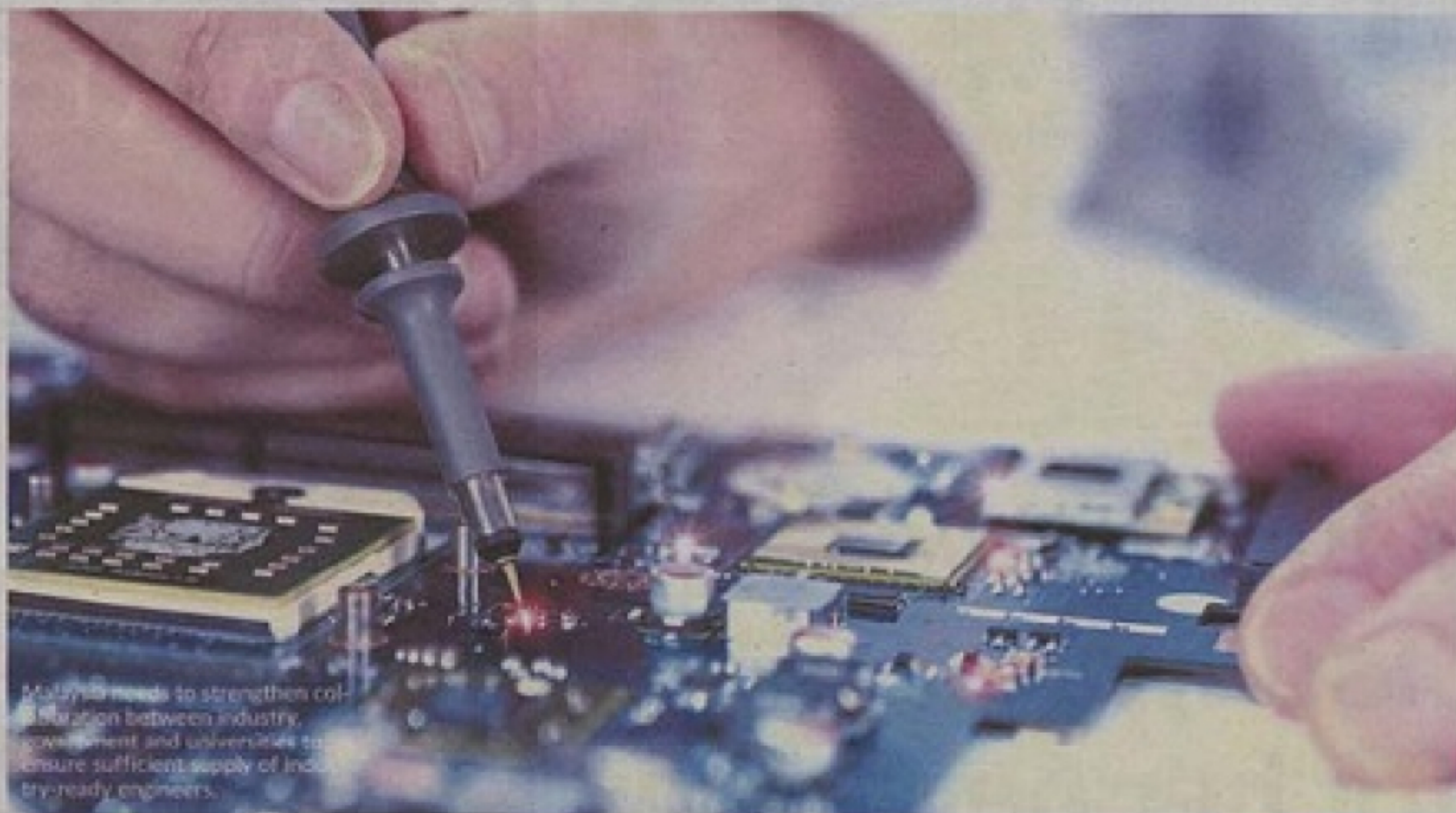
"To expose our university undergraduates to IR4.0, EEPN has also organised an IR4.0 regional conference and also IR4.0-themed hackathons in both East and West Malaysia," he said.

Programmes to support industry

According to Dr Hari, specifically to support the integrated circuit (IC) design and development (D&D) effort, EEPN has initiated the Structured Industry Apprenticeship Programme (SIAP).

He shared, "We developed the SIAP initiative with strong support and commitment from more than 10 companies and government agencies such as the Ministry of International Trade, Malaysian Investment Development Authority (Mida), the Collaborative Research in Engineering, Science and Technology Centre (CREST), Mimos and the Malaysia Productivity Corporation.

"Whilst these companies are competitors, it is pleasing to note that they collaborated to resolve a common problem, namely the lack of talent in IC design."

SIAP, a university enhancement and embedment programme for IC design, has six modules and these were developed via a series of intense sessions with more than 10 companies facilitated by subject matter experts from Mimos and CREST.

"It is an industry-initiated curriculum; the application centric modules are aided by the use of state-of-the-art design tools," he said.

The focus on IC design came about two years ago during several meetings facilitated by EEPN, which was attended by industry representatives. A national survey on the needs of IC design talents was then initiated by Mida, with more than 25 electrical and electronics companies participating in the survey.

Dr Hari added, "We found that more than 5,000 IC design talents are needed over the next five to seven years. Typically, individual companies have progressed to work on specific talent needs with the universities of their choice.

"I think it is difficult for us to go to each and every university, so we have been working together with Assoc Prof Dr Wan Zuhainis Saad, the director of the Ministry of Higher Education's (MoHE) academic excellence division, to identify public and private universities that already have the base capabilities in the area of IC technology.

"There's still a lot of work to be done and unfortunately, when we initiated this about 10 months ago, then came the Covid-19 pandemic, so we have experienced some delays."

As of now, there are seven public universities participating in the pilot project, namely Universiti Sains Malaysia, Universiti Malaysia Perlis, Universiti Malaya, Universiti Teknologi Malaysia, Universiti Teknologi Mara, Universiti Putra Malaysia and Universiti Tun Hussein Onn Malaysia.

Dr Hari further said that SIAP is not just about training the students, but also enhancing the knowledge and competencies of the lecturers in the universities.

"Once the pilot is completed by end of this year, we plan to roll out the SIAP curriculum for IC design to other universities with the support of MoHE.

"As we rolled out SIAP as a pilot project to the seven universities, we also trained over 100 lecturers from various universities (public and private). We hope to complete the year with 65 additional lecturers trained," he said.

The government's role

According to Dr Hari, there are several ways the government could further improve this situation and produce talents that are industry ready.

He opined, "The government should formulate holistic manpower planning for industry; to understand what is needed by the industry over the next five years and to establish a roadmap to achieve this. Follow through is key!

"The government should also have targeted scholarship programmes, especially for our students in science, technology, engineering, and mathematics."

He suggested, as a short-term measure, that the country should have a policy that enables the hiring of foreign talents graduating from local public and private universities. At the same time, the current visa approval process for hiring targeted talents from other countries should also be enhanced.

According to Dr Wan Zuhainis, her division oversees all programmes in universities and making sure that all programmes offered are relevant to the industry.

"It is under the Malaysian education blueprint, which is to produce graduates who are holistic entrepreneurial and balance.

"For this division, we are ensuring that all programmes being offered in the university are relevant and reduce the gap between supply and demand.

"We do not only monitor the programme; we hope that we are facilitating the universities, engaging the industry to identify the gaps and shoes to work together for us to produce this future workforce – not only with the industries, with other agencies and inter ministries collaboration," she said.

She added, "I believe that SIAP is an excellent effort by EEPN to provide students opportunity to experience industry relevant application centric learning.

"Especially (in providing) an industry-immersive experience, not just at the end of semesters but at the beginning.

"Having said that, we need the buy-in from the industry to not only accept our students for internship, but to also co-develop the programme and customise graduates for industry.

"We hope the industries and universities can co-own the programme and take responsibilities-SIAP is a very good example."

Strengthening collaborations

According to Dr Hari, to strengthen collaboration between industry, government and universities, there is a need for more focused industry advisory panels for selected areas by the universities, so that industry subject matter experts can provide the academia the latest technology and application trends in the industry.

Academic staff should also undertake sabbatical in local E&E companies, as there are numerous opportunities to work and gain experience in the state-of-the-art and new technologies in these companies.

In addition, Dr Hari said that while the industry can give feedback to academia on the latest technology trends and cutting-edge technologies, universities must respond quicker to the feedback.

Malaysia needs to strengthen collaboration between industry, government and universities to ensure sufficient supply of industry-ready engineers.

Dr Hari: SIAP is an industry-initiated university enhancement and embedment curriculum for IC D&D.

Dr Wan Zuhainis: Higher education programmes such as SIAP require strong buy-in from the industry in order to be sustainable.

"We need to find a balance between 'increasing more content into the universities' curriculum with specific competencies' versus 'teaching our under-graduates on the fundamentals of science, technology and engineering'," he pointed out.

On emerging trends that will influence the talent development programme, he said, "With IR4.0 and digital technology being ubiquitous, we foresee that software and programming skills will be sought-after skillsets by many employers, with the focus on embedded software engineering, AI, data analytics and cyber security, to name a few.

"Existing engineers who are well-versed in hardware also need to upskill themselves in programming and embedded software development.

"Our next SIAP initiative will be on embedded software engineering. Currently, we are undertaking a survey on the needs of embedded software talents specifically in the E&E industry and supporting companies," said Dr Hari.

He added that in addition to technical skills, engineers also need to be trained on soft skills such as critical thinking, communication and presentation skills.

He concluded, "Our engineers also need to have a more positive attitude towards work, be self-motivated and more willing to learn new skills and not wait for others to tell them what to do."